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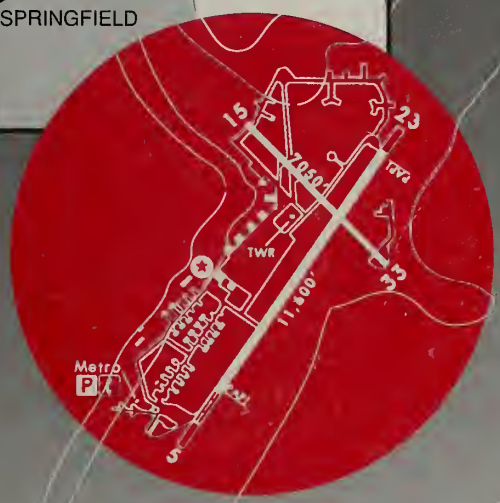
WESTOVER

Joint Land Use Study

FINAL REPORT



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August 1995

W E S T O V E R

Joint Land Use Study

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- Pioneer Valley Planning Commission
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- Town of Ludlow
- Town of South Hadley
- Town of West Springfield

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EXECUTIVE SUMMARY

The Westover Joint Land Use Study (WJLUS) began in 1990 with the decisions of six cities and towns in Massachusetts to participate in a study to determine the impacts of Westover Air Reserve Base on the Pioneer Valley Region. The process lasted over three years, with the focus of the investigation being noise and accident potential and their impacts on development. The initial data driving the study came from the Air Installation Compatible Use Zone (AICUZ) report for Westover, completed in 1990. This report mapped noise contours and Accident Potential Zones (APZs) and made recommendations for the types of development that are suitable and unsuitable within each contour and zone. The 1990 AICUZ data was used because it provides a more conservative estimate of the potential impacts (i.e., larger noise footprints) than the 1993 Supplemental Environmental Impact Statement or the impending 1994 AICUZ report. This conservative viewpoint is appropriate for long-range planning purposes.

Chicopee, Granby, Ludlow, South Hadley, Springfield, and West Springfield were the Massachusetts cities and towns that participated in the WJLUS. Two committees were established to oversee the study: the Policy Committee and the Technical Committee. The participating municipalities appointed members to the committees, generally elected officials and planning staff or Planning Board members. There were also representatives from the Air Force, the Westover Metropolitan Development Corporation (WMDC), and the Pioneer Valley Planning Commission (PVPC). WMDC operates the civilian side of Westover, Westover Metropolitan Airport. The responsibilities of the PVPC included bringing the communities together, facilitating meetings, and providing the staff to conduct the study and manage the contract. Public participation was strongly encouraged - through meeting attendance and through the liaisons with the public, the Policy and Technical Committees.

The assumption underlying the WJLUS is that Westover will remain active as a joint military base and civilian facility. Economic trends in the region and in the world make a facility like Westover extremely valuable. First of all, the military payroll and expenditures bring millions of dollars into the Pioneer Valley. Secondly, the civilian side is especially valuable for industrial development because of the airport facilities, customs clearance, and excellent highway access. Westover's primary runway is the longest in the Eastern United States, capable of handling even the Space Shuttle. Current economic restructuring requires Western Massachusetts' businesses to compete globally, making air transportation of people and goods more important than ever. Therefore, Westover will remain a vital part of the Pioneer Valley economy for the foreseeable future.

The purpose of the WJLUS is to understand both the positive and negative impacts of Westover and design land development strategies to deal with any incompatibilities. A four-part planning process was used. First, existing conditions related to land use and development were identified for each community. This included population trends, housing trends, existing development, and environmental constraints for future development. Second, the noise contours and APZs from the AICUZ report were compared with the existing development in each community to identify any incompatibilities that might need mitigation. Available land within the APZs was assessed to identify possible future conflicts that prevention strategies could alleviate. Third, potential strategies were analyzed for their usefulness in preventing future incompatibilities. Finally, a list of recommendations was generated based on suitability for the particular communities involved in this study.

It was determined that the six communities will continue to feel pressure to develop the land contained within the noise contours of 65 Ldn (average day/night noise levels) and higher and within the

accident potential zones. While the population trends are relatively stable, the demand for new residential housing continues to increase. More development means increasing the likelihood of incompatibilities. Chicopee and Granby are the most significantly impacted. They are on the axis of the longest runway, the one used primarily for military training exercises. Chicopee has the largest concentration of existing development in the APZs and noise contours of 65 Ldn and higher. The details for each community are contained in Section 6.

Development controls were reviewed for their ability to minimize or eliminate the negative impacts of Westover. They were evaluated on the basis of their potential for public acceptance, legal authority needed, effectiveness, and practicality. From this analysis, a set of recommendations was developed for the affected communities. The analysis and recommendations are in Section 7.

The WJLUS has focused Westover's neighboring communities on the advantages that Westover offers to the region as well as the negative externalities affecting the lands closest to it. The stage is set for more cooperative planning between the military installation and these communities. Ensuring compatible development is the goal. Sensible land use planning, good communication between the affected communities and Westover, and public discussion of Westover's role in the region provide the best assurance that the problems created by incompatible land development in Westover's vicinity will not intensify.

Section 1

INTRODUCTION

This report was prepared by the Pioneer Valley Planning Commission as part of the Westover Joint Land Use Study (WJLUS). It is designed to assist participating communities in their efforts to protect their citizen's health and safety by examining the impact of noise and accident potential resulting from proximity to Westover Air Reserve Base. The communities participating in the study are Chicopee, Granby, Ludlow, South Hadley, Springfield, and West Springfield.

The purpose of the WJLUS is to assist communities in understanding Westover's impacts — positive and negative — and design land development strategies that minimize or prevent existing and future incompatibilities. To accomplish this purpose, the Pioneer Valley Planning Commission collected data, reviewed regulations and plans, compiled a land use inventory, and performed analyses of existing land use. This report is the result of these efforts.

1.1 Objectives of This Study

The objectives of this study are as follows:

- Identify the existing conditions relative to land use in each community;
- Determine the extent to which existing uses are incompatible with flight operations in terms of noise impact and accident potential;
- Assess potential strategies for their usefulness in preventing further incompatibilities; and
- Determine which measures suit the needs of the impacted communities.

1.2 Role of Participants

In addition to the responsibility of each community to participate fully in the planning process, there are two entities with differing sets of responsibilities and concerns involved in this Joint Land Use Study: the Air Force and the Pioneer Valley Planning Commission.

The Air Force is responsible for identifying noise contours and accident potential zones specific to Westover Air Reserve Base and making recommendations for compatible land use within them. In addition, the Air Force is responsible for enacting as many noise mitigation measures as possible to minimize the negative impacts upon surrounding communities.

The Pioneer Valley Planning Commission is responsible for assisting communities in identifying measures to mitigate or prevent development incompatible with the flight activities of Westover.

1.3 Why Is Land Use Planning Necessary?

Ensuring that airports and their neighbors can successfully coexist is a community issue, and Westover is part of the Pioneer Valley's regional community. In order to promote compatible land use in the communities surrounding Westover, the impacts of the airport and the potential for development control measures were studied over the three-year duration of the WJLUS. Recommendations for action were prepared in conjunction with the six communities through their planning boards and planning staffs, and through the Policy and Technical Joint Land Use Committees of this study (participants listed in Appen-

dix A). Sensible land use planning, good communication between the affected communities and Westover, and public discussion of Westover's role in the Pioneer Valley Region provide the best assurance that the problems created by incompatible land development in Westover's vicinity will not intensify.

1.4 Organization of This Report

Sections 1 and 2 of this report provide details about the origins, purpose, and organization of the Westover Joint Land Use Study. A description of Westover Air Reserve Base's facilities and operations as well as its economic impacts are the focus of Section 3. The standards for determining land use compatibility with aircraft operations are discussed in Section 4. Existing conditions in the participating communities, detailed in Section 5, are combined with the compatibility standards to produce the findings of Section 6. In this section, each community is profiled, and existing and potential incompatibilities are examined. Section 7, then, suggests strategies for minimizing the impacts of aircraft operation at Westover.

Section 2

OVERVIEW OF THE PLANNING PROCESS

Military installations like Westover Air Reserve Base have both positive and negative impacts on the communities surrounding them. As urban and suburban development encroaches upon these installations, the potential for negative impacts, such as noise and accident potential, increases. To promote compatible use of public and private lands in the vicinity of military airfields, the Department of Defense initiated the Air Installation Compatible Use Zone (AICUZ) program in 1973. As a result of this program, information about noise and accident potential from base operations is available to local governments for planning purposes. Adjacent communities have been encouraged to adopt development control measures to ensure compatible development in the affected areas. To further this objective, the Department of Defense initiated the Joint Land Use Study (JLUS) program in 1985. The JLUS uses AICUZ land use compatibility data in a community planning context. The objective is to encourage cooperative planning between the military installation and the surrounding communities so that future impacts are minimized and existing operational impacts on adjacent land are reduced. The recommendations produced in these studies guide local jurisdictions in the development and implementation of compatible development strategies. The process used in the Westover Joint Land Use Study is detailed below.

2.1 Project Initiation and Organization

The Westover Joint Land Use Study began in 1990 with the decisions of Chicopee, Granby, Ludlow, South Hadley, Springfield, and West Springfield to participate in a study to determine the impacts of Westover upon the communities. In September of 1990, the Air Force released the AICUZ report for Westover. The central features of the AICUZ study were the determination of noise contours and Accident Potential Zones (APZs) for Westover and the identification of land uses that are incompatible within each noise contour and APZ. The AICUZ report based its conclusions on the flight operation of the Air Force Reserve C-5A Training Mission and the Westover Metropolitan Development Corporation civilian flight activity. This information provided the initial data and compatibility standards for the WJLUS.

The WJLUS was jointly funded by the Department of Defense Office of Economic Adjustment (OEA), the Pioneer Valley Planning Commission, the six participating communities and the Westover Metropolitan Development Corporation (WMDC). The study area consisted of the six cities and towns which were divided into two categories: host communities and abutting communities. (See Figure 1.) The host communities for Westover Air Reserve Base are Chicopee, Ludlow, Granby, and South Hadley. The abutting communities are Springfield and West Springfield.

Bringing the communities together, providing the staff to conduct the study, facilitating committee meetings, and managing the OEA contract were the responsibilities of the Pioneer Valley Planning Commission (PVPC). Two advisory committees, the Policy Committee and the Technical Committee, provided oversight and ideas as well as a review the draft report and its recommendations. The Policy Committee included the chief elected officials of the participating municipalities. The Technical Committee generally consisted of town or city planners or a member of the Planning Board. Appointments to the committees were made by the member municipalities. In addition, there were representatives from the WMDC, the Air Force, and the PVPC. The primary functions of the Policy Committee were to provide study oversight and liaison with the general public. The Technical Committee provided a mechanism for

project administration, information exchange, discussion of technical planning issues, and monitoring of the day-to-day study progress.

Public participation and community outreach were important components of the WJLUS. As noted, the Policy and Technical Committees served as the principle public liaisons and input sources for the project. For the first half of the three-year study, the committees met quarterly. The last half of the study focused more on outreach, with dozens of meetings held by PVPC staff in the six communities. Meetings were held with individual representatives of various interests and with planning boards and aldermen. In addition to the numerous meetings where public participation was encouraged, the PVPC prepared two brochures informing the public, first, of the project's initiation and the names of contact persons and, second, of the project's completion and recommendations. These brochures were distributed in meetings in the individual communities and also to the Policy and Technical Committees.

Since the Joint Land Use Study program is administered by the Department of Defense, the focus is on the impacts of military activity on adjacent communities. Westover, however, is a joint military/civilian airport. The impacts of civilian aircraft operations are the focus of a related study, the Federal Aviation Administration's (FAA) Part 150 study, completed under the guidance of the WMDC in 1994. The FAA Part 150 study includes an examination of existing impacts and recommendations for noise attenuation measures like sound insulation of existing structures. The FAA Part 150 study recommendations will be summarized in Section 7 of this report.

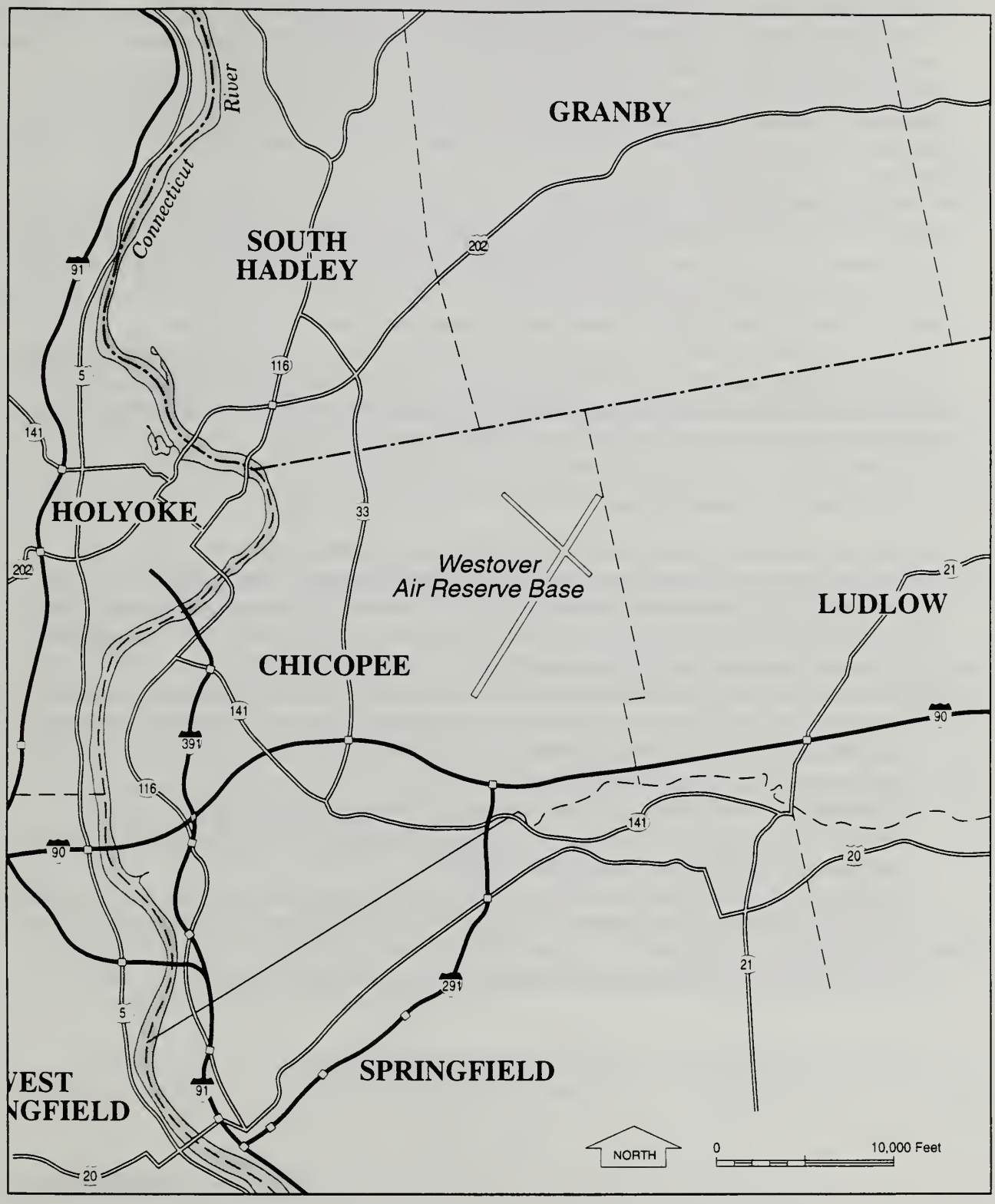


Figure 1. Westover Air Reserve Base and Vicinity

While the Westover Joint Land Use Study began in 1990, several factors delayed its completion. The most significant factors were Desert Shield and Desert Storm. Missions in support of Desert Shield began at Westover in August of 1990, officially interrupting work on the WJLUS. Demobilization of Westover occurred in July of 1991, and work on the study began again. Other factors in the delay of the WJLUS include Environmental Impact Statement (EIS) and AICUZ data conflicts, Supplemental EIS (SEIS) completion delays, and the need for an AICUZ update after resolution of the EIS/AICUZ data discrepancies.

These data discrepancies were taken into consideration as the WJLUS progressed, but it was determined that the issue would not significantly affect the basic development recommendations. The source of the controversy was the fact that the noise impacts estimated in the 1990 AICUZ study were significantly higher than those projected in the 1987 EIS. The discrepancy was due to differences in the calculation of the level of operations at Westover on an "average busy day". A Supplemental EIS, issued in 1993, resulted from the conflict. According to the 1993 SEIS, noise contours for Westover are actually smaller than those indicated in the 1990 AICUZ report (see Appendix D). The WJLUS uses the 1990 AICUZ noise contours because the more conservative estimate of impacts is appropriate for long-range planning and the goal of minimizing future incompatibilities.

2.2 Basic Planning Assumptions

Certain basic assumptions underlie the WJLUS. They are listed below.

- Westover is expected to remain active as a joint military base and civilian facility.
- Military activity is assumed to remain the same or to increase. However, should military activity cease, it is assumed that civilian activity will continue to occur. At present, there are no plans for a significant increase of military activity at Westover.
- Civilian activity at the base is expected to remain the same or to increase, although no increase is currently planned. The current economic restructuring requires Western Massachusetts businesses to compete in global markets, thereby making air transportation of people and goods even more important economically than it has been the past.
- Population growth figures used in this study are those developed by the PVPC.
- Despite the projected slow growth in regional population, the existing land use pattern of low density suburban-type development is expected to continue.
- Existing Air Force operating schedules are considered valid throughout this study. Future projections of aircraft activity can be ascertained from the most recently available Environmental Impact Study (June, 1993).
- Land use guideline criteria are those developed in the AICUZ report of 1990.

OPERATIONS AND IMPACT OF WESTOVER AIR RESERVE BASE

Classified as a General Utility I airport providing comprehensive aviation services to commercial businesses, private corporations, and air charter operations, Westover is the largest airport facility in the Pioneer Valley Region. It is located in the City of Chicopee and the Town of Ludlow within minutes of the Massachusetts Turnpike and Interstate 91. To understand Westover's role in the region, this section covers its history, current facilities and operations, and economic impact. Actions that the Air Force is taking to minimize noise impacts on adjacent lands will be discussed at the end of the section.

3.1 History of the Base

Westover Air Force Base was established in 1940 as a bomber training base and played a strategic role in World War II. In the 1950's it was a staging point for the Berlin Airlift and the home of the Military Airlift Command. From the mid-1950's until its deactivation as an active duty Air Force Base in 1974, it was a major base of operations for the Strategic Air Command.

In 1974 Westover was converted from an active Air Force Base to an Air Force Reserve Base. At the same time, the Westover Metropolitan Development Corporation (WMDC) was created by an act of the Massachusetts Legislature. Approximately half the total acreage of the original Air Force Base was transferred to WMDC. WMDC has as its mission the development and oversight of industrial parks on the 1,300 acres under its jurisdiction. The civilian component of Westover is called the Westover Metropolitan Airport. WMDC has developed three industrial parks and a modern passenger terminal since its inception. This arrangement, where civilian and military activities coexist at the same facility and use the same runways, is called "joint use". Civilian activity operates under the following conditions:

- The control of ground and air movements of all aircraft rests with the military. In other words, the Air Force operates the control tower.
- Arrivals and departures of military aircraft have priority over civil aircraft.

During Operations Desert Shield and Desert Storm, Westover was the main east-bound staging area for the airlift of cargo to the Persian Gulf. Between August 4, 1990 and July 15, 1991, Westover handled more than 1,800 C-5As and other aircraft bound to the Persian Gulf and back, moving approximately 32,000 troops and 80,000 tons of cargo.

The total takeoffs and landings at Westover are modest, despite the facility's size and capacity. In 1992, for example, a total of 37,800 aircraft operations were handled, of which 89.8 percent were military and 10.2 percent were civilian.

3.2 Description of Facilities

Westover Airport consists of 2,500 acres of land with two active runways. Westover's primary runway (05/23) runs northeast/southwest, is 11,600-feet long and 300-feet wide, and is equipped with high intensity runway lights. The primary runway is the longest in the Eastern United States and can handle

any aircraft now operating, including the Space Shuttle. The secondary runway (15/33) is 7,050-feet long and 150-feet wide and crosses the primary runway, running northwest/southeast. (See Figure 2.) The Westover control tower is operated by the Department of Defense from 7 a.m. to 11 p.m. daily. Military uses of the Westover facility are currently guided by a planning document titled "Installation 2000."

In 1987, a two-phase development plan was prepared as part of a Master Plan for the civilian airport. The short-range development program includes the construction of taxiway "P", the beginning of a multiphase cargo facility, the construction of a new fixed base operators (FBO) facility area, the continuation of the WMDC aviation fuel facilities, and improvements to the passenger terminal area. The long-range development program includes the completion of taxiway "P", long-range cargo facilities, the expansion of existing aircraft aprons, rehabilitation of taxiways "S" and "A", and the expansion of the FBO site.

3.3 Inventory of Aircraft

Westover Air Reserve Base serves as the home of the C-5A Strategic Airlift Training Mission conducted by the Air Force Reserve 439th Military Airlift Wing. Sixteen (16) C-5As are based at Westover for this purpose. The C-5A Galaxy Cargo Jet has a wing span of 222 feet; length of 247 feet, 10 inches; height of 65 feet, 1.5 inches; and a payload of 250,000 pounds.

In addition, Westover has several other military tenants, including the Massachusetts Army National Guard which has thirty-five (35) helicopters at the base. These helicopters are primarily engaged in training activities. Finally, a total of fifty-seven (57) tenants of Westover Metropolitan Development Corporation also base their private planes at the airport.

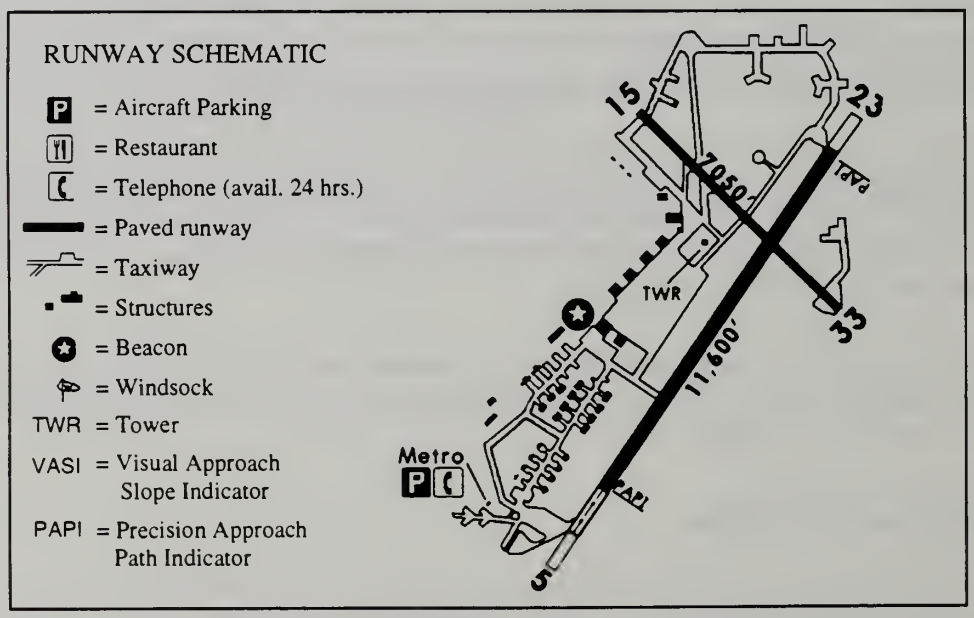


Figure 2. The Westover Airfield

3.4 Flight Operations

The basic mission of Westover Air Reserve Base is to train C-5A crews and provide for skill maintenance. Pilots and copilots must meet training requirements on a monthly or quarterly basis. These training flights require the C-5As to circle the region and practice many different maneuvers involving repeated approaches to the air field. Local training takes place approximately twenty hours per week and one weekend per month. No training flights are conducted between 11 p.m. and 7 a.m. Unless weather conditions require a change, C-5As approach the runway over Granby and depart over Chicopee (runway 05/23). The Air Force Reserve has adopted a series of noise mitigation strategies related to flight operations. These are discussed in Section 3.6.

In addition to C-5A training flights, the Massachusetts Air National Guard helicopters, transient military aircraft, and the Westover Metropolitan Airport civilian aviation activities were considered when compiling the following statistics. It should be noted that less than 2.5 percent of all flights and less than 0.24 percent of C-5A operations are at night. Operations are defined as arrivals and departures as well as training pattern operations (approaches and touch-and-goes).

Table 1. Average Daily Activity at Westover*

Aircraft Type	# of Operations/Day
Military	130.52
Civilian	10.59

**Source: Table C-1, Page C-2 of the Westover SEIS.*

The statistics shown in Table 2 depict runway utilization by both military and civilian aircraft. The C-5As use the long runway (05/23 Chicopee/Granby) 97.7 percent of the time and use the short runway (15/33 South Hadley/Ludlow) only 2.3 percent of the time. The greater percentage of arrivals and departures for all types of aircraft occurs over Granby. This pattern was established to minimize the number of people affected by noise and accident potential. (Granby has far fewer inhabitants in affected areas than Chicopee.) Civilian aircraft use runway 15/33 much more frequently than the military aircraft.

Table 2. Runway Utilization

Use by C-5A Aircraft	% of All Operations	% of Arrivals	% of Departures
23 (Granby)	78.38	38.65	39.73
05 (Chicopee)	19.30	9.65	9.65
33 (Ludlow)	2.32	1.16	1.16
15 (South Hadley)	0.00	0.00	0.00
Use by All Aircraft			
23 (Granby)	68.94	32.45	36.49
05 (Chicopee)	16.31	9.59	6.72
33 (Ludlow)	14.75	7.37	7.37
15 (South Hadley)	0.00	0.00	0.00

Source: 1990 AICUZ for Westover, page 8.

3.5 Economic Impact of Westover

At a Glance:

	Military Impact	Civilian Impact
Local Payroll	$30,534,315	42 Businesses
Number of Jobs	1,100 Full-Time 3,423 Part-Time	2,715 Jobs

Westover is a *basic* industry for the Pioneer Valley Region. This has enormous economic significance. The definition of a basic industry is one that brings money into a region rather than simply recirculating it. The funds used to pay Westover personnel, contractors, and suppliers come from outside of our region. Therefore, it is "new" money for this region. In addition, because Westover is supported by tax dollars, it can be thought of as a way of reclaiming some of the region's federal tax contributions. Basic industries are what support an economy. Without them, a regional economy would collapse as goods and services purchased from outside the region removed money from internal circulation. Like a national economy, a regional economy must have a positive balance of trade over time in order to prosper.

Economic impact can be divided into four categories. The three most obvious are job creation or payroll; purchases of services; and purchases of goods. The fourth, less obvious and more difficult to quantify, is the "multiplier" effect. Each person or business who receives money from Westover is likely to spend some portion of that money within the region. In addition, the Air Force purchases goods and services. The multiplier effect measures how many times money brought into the region circulates in the region. It also measures how many jobs are created indirectly by virtue of providing goods and services to Westover.

The difficulty in determining the multiplier effect is in identifying the geographic area of economic impact. For a military installation such as Westover, the multiplier effect would probably be 2.5 - 3.5 if the whole United States were considered the impact area. In that case, we could look at such things as the where the uniforms issued to reservists are made and count those jobs part of Westover's economic impact. For the purpose of this analysis, however, only funds expended in this region were considered. This gives a somewhat conservative picture of Westover's impact since the payroll of Reservists who do not live in the region is not considered, even though those Reservists are likely to make some purchases while they are here in the Pioneer Valley.

The perception that many Reservists do not live in the Pioneer Valley Region is, in fact, incorrect. One thousand twenty-nine (1,029) Reservists live in Hampshire and Hampden Counties. An additional 235 Reservists live in Connecticut within fifty miles of Westover.

The numbers shown in Table 3 should give a clear picture of Westover Air Reserve Base's economic impact on the Pioneer Valley Region. The numbers presented are for the fiscal year October 1, 1991 through September 30, 1992. As the numbers indicate, Westover contributes $41,391,686 in direct payments to local residents and businesses. These payments have an economic impact on the region of between $103,479,214 and $144,870,900. It should be noted that these numbers do not include an additional $74,374,567 that was paid in FY 92 to military retirees living in the region. These monies were not considered in the analysis because they will be paid to the retirees whether or not Westover continues to operate. However, this money also continues to recirculate in the region. Although the multiplier for payments to retirees is considered to be lower than that for the payroll of working people, even a multiplier of 1.5 would indicate that these retiree payments would have an impact of $111,561,850 on the Pioneer Valley.

Table 3. 1992 Military Payroll and Expenditures

Type	Total	Local Share	Multiplier 2.5	Multiplier 3.5
Payroll	$56,722,899	$30,534,315	$ 76,335,787	$106,870,102
Construction	$16,571,577	$ 4,664,355	$ 11,660,887	$ 16,325,242
Goods & Services		$ 6,193,016	$ 15,482,540	$ 21,675,556
Totals		**$41,391,686**	**$103,497,214**	**$144,870,900**

Westover Metropolitan Development Corporation (WMDC) constitutes what is generally referred to as the "civilian side" of Westover Field. The organization was created by an act of the Massachusetts Legislature in 1974 to oversee the development of the areas known as the Westover Industrial Airparks (Figure 3). WMDC's airport revenues are generated from land leases of the different airport structures, fees charged to commercial operators landing at the airport, fuel sales fees, and other fixed base operators' income.

The Westover Industrial Airparks have a considerable economic impact on the region. There are currently forty-two businesses employing 2,715 people. A conservative estimate of the payroll of these forty-two companies is between $72 million and $105 million, annually.

The 256 acres in WMDC's airparks is especially valuable for industrial development because of the airport facilities, customs clearance, and access to the Massachusetts Turnpike and Interstate 91. Therefore, it is expected that this area will contribute significantly more to the regional economy in the future.

Another asset on the civilian side is the 14,600 square foot passenger terminal that opened in 1988. The building is equipped with modern passenger security screening equipment and can manage 300 passengers per hour. The ability of the airport to handle passengers as well as cargo adds to its economic importance in the region.

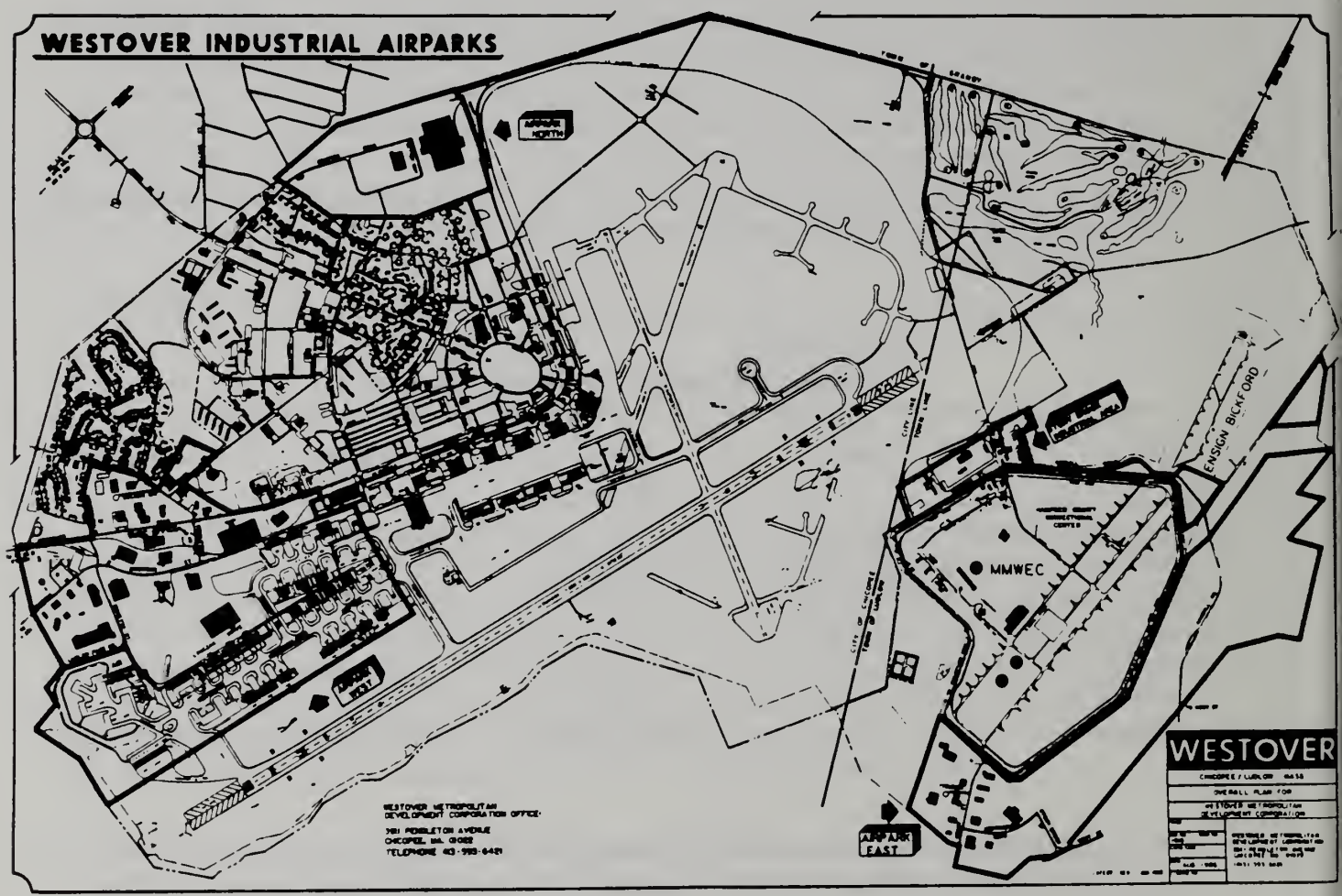


Figure 3. Westover Industrial Airparks

3.6 Existing Noise Abatement Procedures

While the positive economic impacts of Westover are vital to the region, there are also some less desirable impacts such as noise. In recognition of the noise problem, the Air Force has already implemented noise abatement procedures. These existing procedures fall into four categories: climb profile, visual traffic pattern altitude, circling approaches, and TACAN instrument landing approaches. The following descriptions are based on the FAA Part 150 study reports. Additional abatement measures resulting from the FAA Part 150 study have been forwarded to the FAA for consideration and required action. Several of the recommendations outlined in the final FAA Part 150 Study Report would require federal funding assistance in order to be successfully implemented. Section 7.3 of this report provides a summary of the key FAA Part 150 study recommendations which were published in October 1994.

The climb profile for C-5A training aircraft at Westover is more steep than normal to concentrate takeoff noise along the centerline of the runway. These aircraft cannot turn or retract wing flaps until they are 1,800 feet above the ground. Normally, turning can be initiated at 400 feet, and wing flaps can be retracted at 1,000 feet above the ground.

The visual traffic pattern, a local proficiency sortie, is normally flown at 1,200 feet. At Westover, this altitude has been increased to 1,800 feet above ground level. [Local aircraft proficiency maneuvers (sorties) include a minimum review of boldface emergency procedures, a simulated engine-out landing, a simulated engine-out go-around, a visual flight rules (VFR) pattern (weather permitting), a circling approach, and three instrument approaches or two instrument approaches and a holding pattern.]

The circling maneuvers for local aircraft proficiency maneuvers (sorties) are flown at a pattern altitude of 1,000 feet at Westover until the aircraft intercepts the final approach path and begins its descent. This represents an increase over the normal requirement that circling approaches be flown at 635 feet.

TACAN approach (an instrument runway approach) procedures have also been modified at Westover to mitigate noise impacts. The published TACAN instrument approach to Runway 23 places aircraft 435 feet above a residential neighborhood. The Westover training procedure differs in that the aircraft must visually avoid overflying homes in the Acrebrook neighborhood located in Granby.

The FAA Part 150 study, conducted under the guidance of the WMDC, proposes a number of new noise abatement procedures for Westover Field. The details of these measures are contained in the study's final report, "Noise Compatibility Program", which was issued in October of 1994.

Section 4

TECHNICAL DETERMINATIONS OF COMPATIBILITY

Having described the type of facilities and activities that occur at Westover and the general impacts — both positive and negative — in the previous section, the focus now shifts to the specific determinations of height limitations and noise and accident potential as revealed in the Air Installation Compatible Use Zone (AICUZ) study of Westover. How the height limitations, Accident Potential Zones (APZs), and noise contours were determined will also be covered here.

This section of the WJLUS Report provides information and explanations of the AICUZ compatibility standards, but does not reproduce the technical information on which they are based. Those who are interested in reviewing the technical data are referred to Volume II of the 1990 AICUZ report.

4.1 The Role of AICUZ

Since 1973, the Air Force has prepared AICUZ studies that describe how current military operations affect the surrounding areas. They are updated when the mission changes significantly (e.g., type of aircraft or number of operations). An updated AICUZ Study for Westover Air Reserve Base was prepared by the Air Force and released in September, 1990. It was undertaken to provide communities with health and safety information related to the conduct of aircraft flights at Westover. Specifically, the AICUZ Study presents the height limitations, noise contours, and Accident Potential Zones for Westover's C-5A training mission and the civilian activity generated by Westover Metropolitan Airport. Using this information, the Air Force prepared recommendations on what development is compatible with Westover's level of aircraft activity.

The height compatibility standard is based upon criteria that determine whether an object or structure presents an obstruction to air navigation. Accident potential is based on a "concentration of persons per acre standard". The concentration of persons per acre standard, applicable to both APZ I and II, states that "uses are compatible if they do not result in a gathering of individuals in an area that would result in an average density of greater than twenty-five persons per acre per hour during a twenty-four hour period, not to exceed fifty persons per acre at any time." The noise guidelines are essentially the same as those published by the Federal Interagency Committee on Noise in the June 1980 publication, "Guidelines for Considering Noise In Land Use Planning and Control." Noise susceptible development like residences and places of assembly are considered incompatible with high noise zones.

4.2 Height Limitations

The height limitation areas recommended by the AICUZ report are those specified by the Federal Aviation Administration (FAA) Regulations, Part 77. In the designated areas, notification of the FAA is required for the construction of any structure higher than 200 feet above ground surface level.

In addition, the FAA must be notified of any construction that protrudes above the "Air Space Control Surface Planes" described by Figure 4. These planes are imaginary slopes and surfaces used to determine if an object or structure is an obstruction to air navigation. Applicable definitions of the surfaces shown

on the diagram in Figure 4 are listed below. The map indicating where these planes lie in the Pioneer Valley is shown in Figure 5.

Primary Surface. This surface defines the limits of the obstruction clearance requirements in the immediate vicinity of the landing area. The Primary Surface comprises surfaces of the runways, runway shoulders, and lateral safety zones. The length of the primary surface is the same as the runway lengths (in the case of Westover, 11,600 and 7,050 feet). The width of the primary surface is 300 feet or 150 feet on each side of the runway centerline.

Clear Zone Surface. This surface defines the limits of the obstruction clearance requirements in the vicinity contingent to the end of the primary surface. The clear zone surface is 3,000-feet long and 3,000-feet wide.

Approach-Departure Clearance Surface. This surface is symmetrical about the extended runway centerline, begins as an inclined plane (glide angle) 200 feet beyond each end of the primary surface at the centerline elevation of the runway end, and extends for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 along the extended runway (glide angle) centerline until it reaches an elevation of 500 feet above the established airfield elevation. It then continues horizontally at this elevation to a point 50,000 feet from the start of the glide angle. The width of this surface at the runway end is 2,000 feet; it flares uniformly to a width of 16,000 feet at an altitude of 50,000 feet above ground level.

LEGEND

A Primary Surface
B Clear Zone Surface
C Approach Departure Clearance Surface (Glide Angle)
D Approach Departure Clearance Surface (Horizontal)
E Inner Horizontal Surface
F Conical Surface
G Outer Horizontal Surface
H Transitional Surface

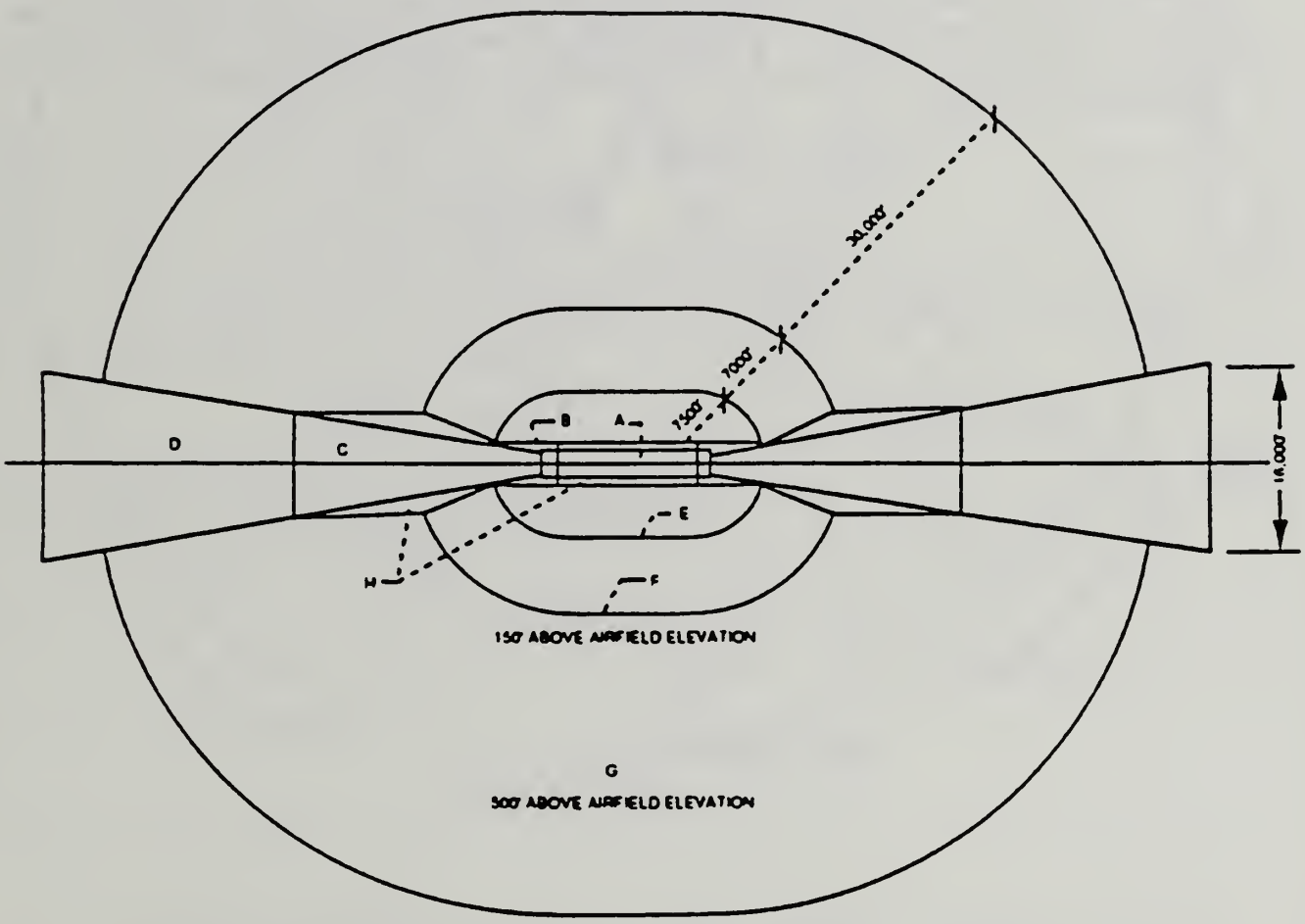


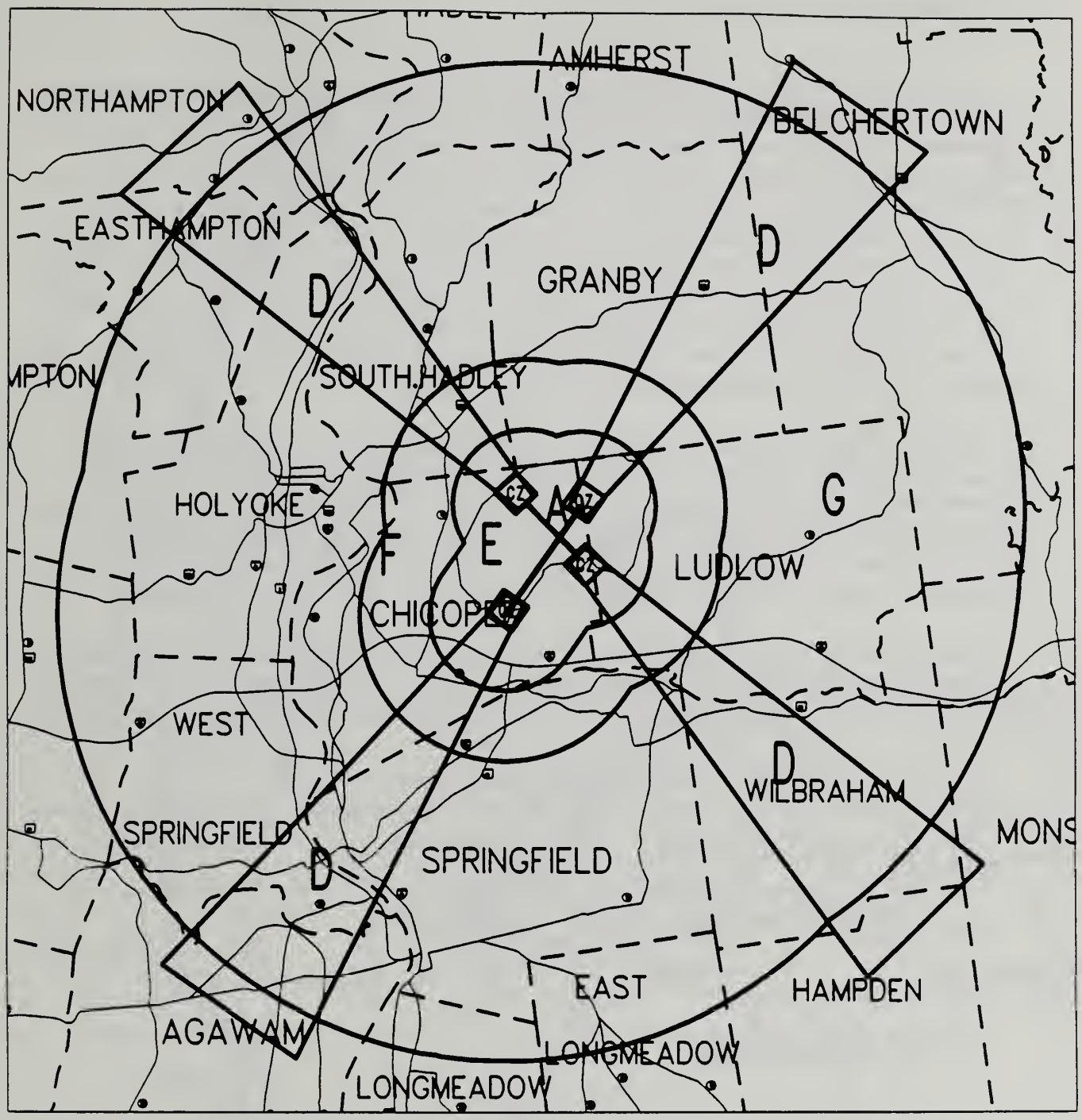
Figure 4. Air Space Control Surface Plan

Inner Horizontal Surface. This surface is a plane, oval in shape at a height of 150 feet above the established airfield elevation. It is constructed by scribing an arc with a radius of 7,500 feet above the centerline at the end of the runway and interconnecting these arcs with tangents.

Conical Surface. This is an inclined surface extending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation.

Outer Horizontal Surface. This surface is a plane located 500 feet above the established airfield elevation. It extends for a horizontal distance of 30,000 feet from the outer periphery of the conical surface.

Transitional Surfaces. These surfaces connect the primary surfaces, clear zone surfaces, and approach-departure clearance surfaces to the outer horizontal surface and the conical surface. The slope of the transitional surface is 7:1 outward and upward at right angles to the runway centerline. To determine the elevation for the beginning of the transitional surface slope at any point along the lateral boundary of the primary surface, including the clear zone, draw a line from this point to the runway centerline. This line will be at right angles to the runway axis. The elevation at the runway centerline is the elevation for the beginning of the 7:1 slope.



A - Primary Surface
CZ - Clear Zone Surface
D - Approach Departure Clearance Surface
E - Inner Horizontal Surface
F - Conical Surface
G - Outer Horizontal Surface

Figure 5. Air Space Control Surface Planes for the Pioneer Valley

4.3 Accident Potential Zones

The Accident Potential Zones identified in the AICUZ Study reflect statistics gathered from military aircraft accidents around the world. The data from these accidents provided information that shows that 70 percent of all accidents occur close to the runway, based on Air Force data from the years 1968 to 1980. By plotting the location and frequency of accidents and making other determinations based on the type of aircraft and flying activities at Westover, a determination of the APZs was made. A detailed discussion of the statistical issues is contained in the AICUZ report. What the Air Force determined is that there is an area of land closest to the end of the runway that is the most dangerous. This area, which is 3,000 feet by 3,000 feet, is referred to as the Clear Zone because it should be kept clear of any obstruction. Twenty-nine percent (29%) of the accidents studied occurred within this area (Table 4). At Westover, the identified Clear Zones at the end of each runway (measured from the take-off/landing threshold) are owned entirely by the Air Force.

The area that is next most likely to sustain an accident reaches 5,000 feet beyond the Clear Zones. This is referred to as the Accident Potential Zone I (APZ I). Statistically it sustains 7.9 percent of all accidents studied. The final designated area stretches an additional 7,000 feet beyond APZ I and is called Accident Potential Zone II (APZ II). These areas have sustained 4.9 percent of the accidents studied. Both of these zones are 3000-feet wide. The APZs for Westover are depicted in Figure 6. Statistically, accidents also occur on the runway itself (28 percent) and within ten nautical miles (30 percent).

Westover has an excellent safety record. Twenty-six years have passed since an accident occurred at Westover. However, it is important to use the Accident Potential Zone information for land use planning purposes so that a catastrophe of major proportions can be avoided.

Table 4. Accident Potential Zones

	Length	Width	% of Accidents
*Clear Zone**	3,000 feet	3,000 feet	29.0%
APZ I	5,000 feet	3,000 feet	7.9%
APZ II	7,000 feet	3,000 feet	4.9%

* *measured from take-off/landing threshold*

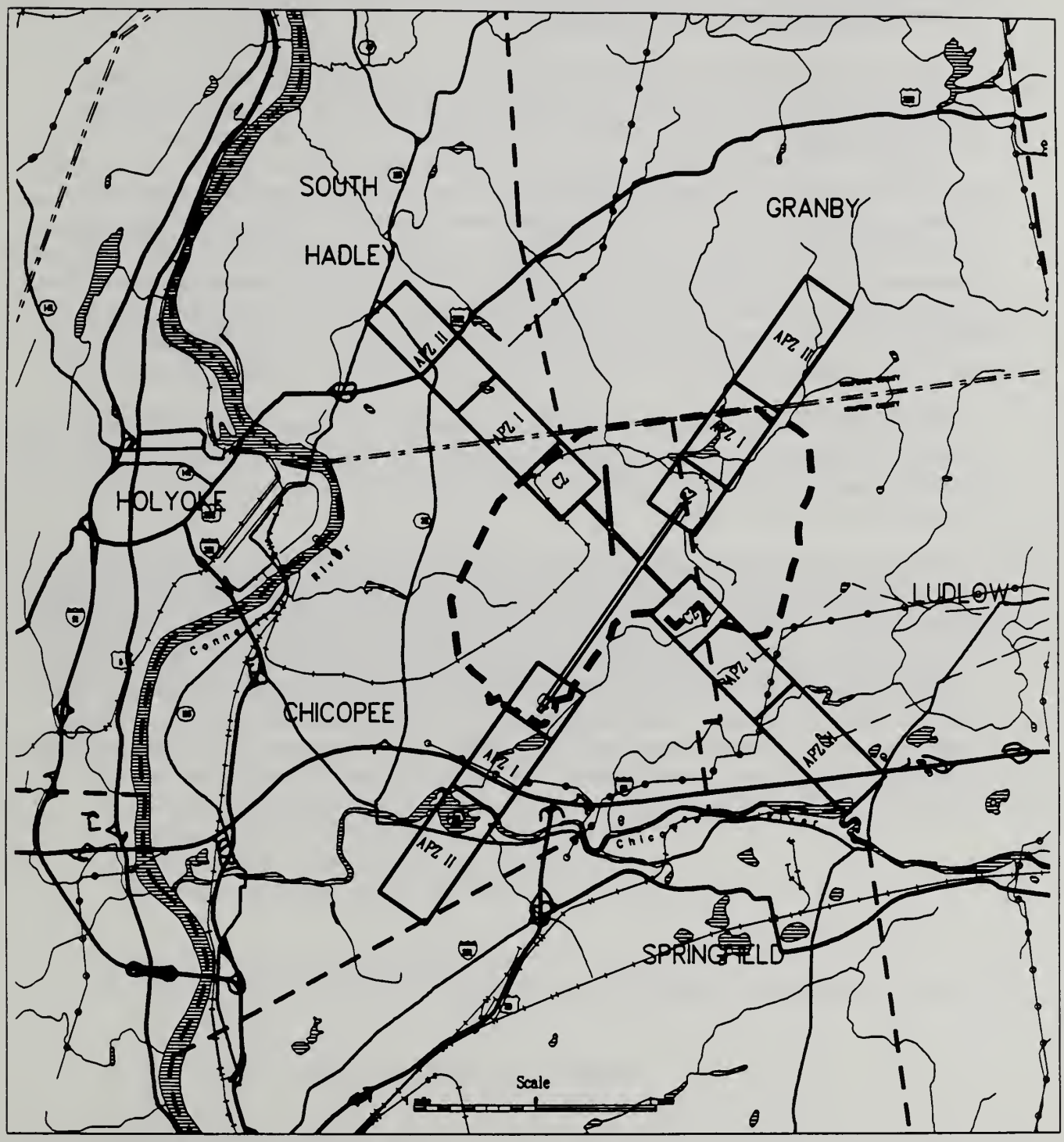


Figure 6. Accident Potential Zones

4.4 Noise Issues

To gain a better understanding of the noise contour maps produced by the AICUZ study, basic concepts about noise will be reviewed first. This section will provide familiar references for sound levels and explore how people respond to high noise levels.

No one likes the disturbance of loud noise. The effects of noise on living conditions have been of public concern since the early 1950s. In the 1960s the FAA and other government agencies began producing informational guidelines for dealing with noise created by aircraft. In response to mounting concern over the adverse effects of airplanes, in 1970 the Department of Housing and Urban Development (HUD) issued noise mitigation guidelines for all units of housing constructed with HUD funds and mortgages guaranteed by HUD. Similar guidelines were adopted by the Farmers Home Administration and the Department of Veterans Affairs. The noise thresholds were developed by the Federal Interagency Committee on Noise (FICON). Members included the DOD, FAA, HUD, and the Environmental Protection Agency (EPA). Sixty-five (65) Ldn (average day/night noise levels) was determined to be the threshold above which housing needed sound attenuation or should not be built. No housing would be funded for areas exposed to noise levels above seventy-five (75) Ldn.

Most agencies dealing with noise exposure have adopted the Ldn measure. Ldn is the average noise level over a 24-hour period, although noises occurring at night are artificially increased by 10 dB. This reflects the added intrusiveness of nighttime noise and the typical decrease (estimated to be 10 dB) in background noise levels at night.

The noise generated by aircraft at their flying altitude has generally not been a problem for communities surrounding airports. Problem levels of noise occur during departures, landings, and engine maintenance "runups". There is no dispute that the noise levels generated by planes during these activities is a problem. Instead, the debate concerns the severity of adverse impacts of noise. The literature on noise impacts generally agrees that hearing loss may begin to occur when the average day/night sound level exposure is above 75 decibels. There is disagreement over whether or not there are other significant health issues related to continuous exposure to high noise levels. Table 5 provides a frame of reference for typical outdoor and indoor noise levels.

Table 5. Noise Level Comparisons

Outdoor Sound Levels	Noise Levels in Decibels	Common Indoor Sound
Concorde landing at 370 ft.	100 - 110	Rock band
Gas lawn mower at 3 ft.	90 - 100	Inside subway train (NYC)
Diesel truck at 50 ft.	80 - 90	Food blender at 3 ft. Garbage disposal at 3 ft.
747 takeoff at 1000 ft	70 - 80	Vacuum cleaner at 10 ft.
Commercial area noise	60 - 70	Normal speech at 3 ft.
Quiet urban daytime	50 - 60	Dishwasher/next room
Quiet urban night	40 - 50	Small theater, background
Quiet suburban nighttime	30 - 40	Library
Quiet rural nighttime	20 - 30	Bedroom at night
	0 - 10	Threshold of hearing

In addition to measurable impacts of noise such as hearing loss, the subjective impact of annoyance is also important. The interruption of speech and sleep are the primary types of "annoyance impacts" caused by aircraft noise, and individuals respond to them differently. The Office of Environmental Quality of the FAA has listed the following as significantly affecting an individual's response to noise. It is interesting to note that eight of these are measurable, or objective, characteristics and five are subjective characteristics.

The subjective characteristics affecting an individual's response to noise are:

1. Feelings about the necessity or preventability of the noise;
2. Judgment of the importance and value of the primary function of the activity producing the noise;
3. Attitudes about the environment;
4. Beliefs concerning the effect of noise on health; and
5. Feeling of fear associated with the noise.

The objective, or measurable, characteristics are:

6. Activity at the time an individual hears a noise and the disturbance experienced as a result of the noise intrusion;
7. Ability to hear sound;
8. Type of physical setting — rural, suburban, or urban;
9. Time of day;
10. Season of the year;
11. Predictability of the noise;
12. Control over the noise source; and
13. Length of time an individual is exposed to a noise.

Research on community attitudes toward noise has consisted of logging noise complaints and measuring distances at which speech is interrupted by noise. Individual reactions to noise vary widely for a given noise level. Nevertheless, people's aggregate response to factors such as speech and sleep interference is predictable and relates to measures of cumulative noise exposure such as Ldn. The following table was prepared by the Texas Aeronautics Commission.

Table 6. Community Reaction to High Noise Levels.

Day/Night Average Sound Level in Decibels	Average Community Reaction	General Community Attitude Toward Area
75 and above	Very Severe	Noise is likely to be the most important aspect of community environment
70	Severe	Noise is one of the most important adverse aspects of community environment
65	Significant	Noise is one of the important adverse aspects of community environment
60	Moderate	Noise may be considered an adverse aspect of community environment

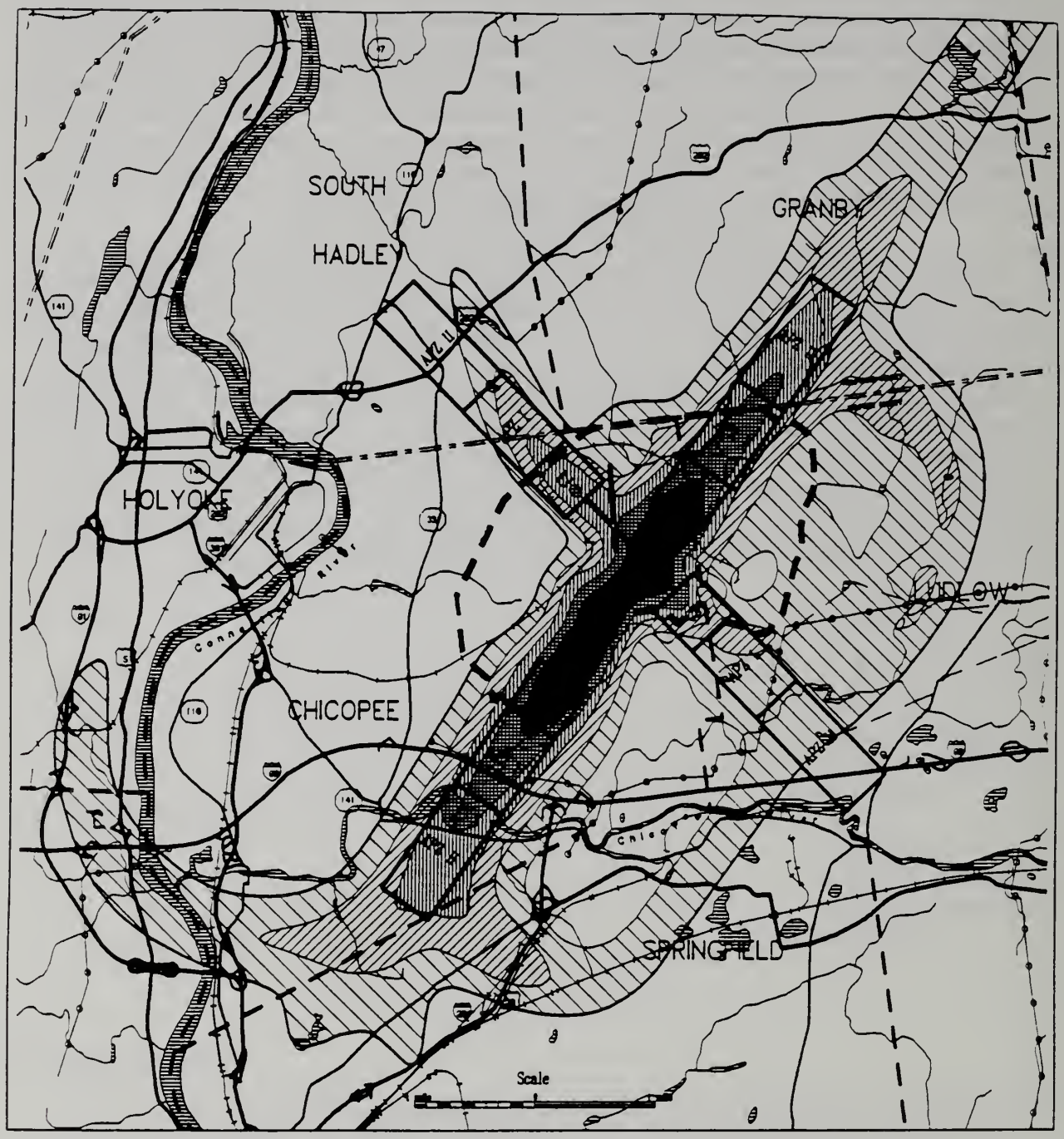
4.5 Noise Contours

The noise contours identified in the AICUZ report indicate the average day/night noise levels (Ldn) to which an area is exposed. The contours, developed by a DOD computer model (NOISEMAP), are mapped lines which indicate variation in noise intensity exposure. The first step in developing noise contours for Westover was to collect information about the type, frequency, flight patterns, engine power settings, cargo weight, and other characteristics of aircraft using the airport. This information was then processed by NOISEMAP to simulate noise measurements at ground level.

The first set of noise contours for Westover was generated in 1978 and released to the local governments in the surrounding communities. The subsequent change in mission to the training of C-5A cargo jet crews, the redistribution of transient aircraft flying patterns, and the addition of commercial aircraft

service required an additional AICUZ report, released in 1990. The noise contours are divided into four levels of exposure: 65 - 70 Ldn, 70 - 75 Ldn, 75 - 80 Ldn, and 80+ Ldn. The noise contours indicate which areas are impacted with average day/night noise levels of 65 Ldn or above. The fact that noise contours reflect average noise levels is very important. The noise contours reflect what is called "single event" noise (e.g., the flight of a single aircraft) by averaging it with noise levels when planes are not flying, relying upon the cumulative noise levels to understand the actual noise environment and its impacts. Obviously, the more often planes fly, the higher the average goes. Also, nighttime flights are weighted more heavily. The model does not consider differences in terrain.

The noise contours used in the Westover Joint Land Use Study are from the 1990 AICUZ report, the more conservative estimate of noise impacts as compared to the 1993 SEIS. The Draft SEIS for Military and Civil Aircraft Operations at Westover Air Reserve Base, released in June 1993, contained updated noise contours (see Appendix D). The SEIS was prompted by differences in pre-Desert Shield noise impacts depicted in the AICUZ and the original EIS. It also addressed the request by WMDC to expand tower operations to 24 hours per day for civil aviation operations. The newer, 1993 noise contours, which are actually smaller than the 1990 contours, were reviewed for their relevance to the WJLUS. It was determined that no changes to current recommendations were necessitated by this new information. The objective of the WJLUS is to anticipate and plan for increased levels of activity at Westover, both military and commercial, and any increase in activity would cause the noise footprint to grow.



Average Day/Night Noise Levels

60 - 65 Ldn
65 - 70 Ldn
70 - 75 Ldn
75 - 80 Ldn
80 Plus Ldn
06/14/93

Figure 7. Noise Contours for 1990 at Westover ARB

Section 5

EXISTING CONDITIONS IN THE STUDY AREA

The WJLUS utilizes the land use compatibility standards of the AICUZ report, described in Section 4, as the basis for determining compatibilities in the study area. This section details the population trends and land use patterns specific to the Pioneer Valley Region and the six participating communities that will affect the forecasting of future development.

To determine compatible development for the communities involved in the WJLUS, the PVPC collected and assessed information on wetlands, slopes, soils, existing zoning and land use, land ownership patterns, flood plains, and protected open space. This information was then compared with the AICUZ recommendations. The results of these comparisons are presented here and in Section 6.

5.1 Population Trends

When Westover Air Force Base was first opened in 1940, the total population of Hampden and Hampshire Counties was 404,568. Despite the Base's proximity to the cities of Springfield and Chicopee, the region was predominantly rural. Neither the Massachusetts Turnpike nor Interstate 91 (both begun in the 1960s) existed. By 1990 the regional population had climbed to 602,878, an increase of almost fifty percent. A substantial amount of that growth occurred between 1950 and 1970, when the number of people rose from 455,565 to 583,031, a 28 percent increase. Table 7 shows the Pioneer Valley Region's population change from 1940 to 1990.

Table 7. Regional Population Change (Hampden and Hampshire Counties) 1940 - 1990

Year	Population	Increase	% Change
1940	404,568		
1950	455,565	50,997	12.6
1960	534,584	77,019	16.9
1970	583,031	50,447	9.5
1980	581,831	-1,200	-0.2
1990	602,878	21,047	3.6
Total Change		**198,310**	**49.0**

The following population density chart (Table 8) further illustrates this population change. Note that the population density increases in the four host communities, namely Chicopee, Granby, Ludlow, and South Hadley.

Table 8. Population Density 1940 and 1990

	1990 Population	Land Area Sq. Miles	1940 Pop/Sq.Mi.	1990 Pop/Sq.Mi.
Hampden Cty.	456,310	618.5	537	737.7
Hampshire Cty.	146,568	529.0	137	277.1
Chicopee	56,532	22.9	1,819	2,475.4
Granby	5,565	27.9	39	199.7
Ludlow	18,820	27.1	302	693.2
South Hadley	16,685	17.7	387	942.3
West Springfield	27,537	17.6		1,564.6
Springfield	156,983	32.1	4,659	4,889.8

5.2 Existing Land Use

There are forty-three communities within the Pioneer Valley Region. The region's total area is 1,179 square miles, an area only slightly smaller than Rhode Island. Approximately 26 percent of the region's land area is developed, and the largest land use is residential development. In 1985, 83,658.86 acres, 11 percent of the total land area, was dedicated to housing. This represents an increase of 12,727.19 acres over 1971. Table 9 shows the increase in residential development in the study area for the period between 1971 and 1985.

Table 9. Residential Development 1971 - 1985

	Acres
Chicopee	359.4
Granby	259.3
Ludlow	414.2
South Hadley	233.6
Springfield	354.8
West Springfield	402.6
Total	**2,023.9**

As Tables 10 and 11 indicate, the increase in residential development accounted for most of the total increase in acres consumed between 1971 and 1985.

Table 10. Residential Development As Percentage Of Total Development

Community	Residential Acreage in 1971	% of Total Land Area	Residential Acreage in 1985	% of Total Land Area
Chicopee	4,559.1	29.9	4,918.5	32.2
Granby	1,488.4	8.2	1,747.7	9.7
Ludlow	2,682.2	14.7	3,096.4	17.0
South Hadley	2,472.5	21.1	2,706.0	23.1
Springfield	9,540.9	45.1	9,895.8	46.8
W. Springfield	2,783.7	24.8	3,186.3	28.4

Table 11. Total Acres For Residential, Commercial & Industrial Development

	Developed Acreage In 1971	% Of Total Land Area	Developed Acreage In 1985	% Of Total Land Area
PV Region	82,568.22	10.9	98,149.18	13.0
Chicopee	5,674.96	37.2	6,183.35	40.5
Granby	1,614.93	9.0	1,929.36	10.7
Ludlow	2,939.1	16.2	3,440.25	18.9
South Hadley	2,647.16	22.6	2,930.39	25.0
Springfield	11,922.37	56.4	12,510.77	59.1
W. Springfield	3,744.57	33.3	4,362.72	38.8

Between 1985 and 1989, the region experienced a "building boom" that is reflected in building permit statistics. Throughout the 1970s, permits for single family homes remained relatively stable, decreasing somewhat toward the end of the decade. Then, in 1981 the number of residential building permits issued reached a twenty-one year low. Increases began again in 1985.

Table 12. Average Number Of Building Permits Per Year*

	1980-1984	1985-1989
Chicopee	77.6	187.8
Granby	14.2	47.6
Ludlow	44.2	99.8
South Hadley	23.0	69.0
Springfield	78.8	248.8
West Springfield	32.8	76.4

** Not all permits result in actual construction*

Multifamily housing permits also increased during this period, as shown in Table 13.

Table 13. Average Number Of Building Permits Per Year For Multifamily By Number Of Units*

	# of Units 1980 - 1984	# of Units 1985 - 1989
Chicopee	56.4	79.2
Granby	No Multifamily	No Multifamily
Ludlow	17.8	36.8
South Hadley	40.8	31.0
Springfield	25.4	156.8
West Springfield	51.8	76.0

** Not all permits result in actual construction*

Section 6

STUDY FINDINGS - REGIONAL AND COMMUNITY-SPECIFIC

The data presented in the previous sections already suggest the importance of Westover to the Pioneer Valley Region. It has also been noted that noise and accident potential are negative impacts for some areas located close to the Base. In this section, the regional trends affecting development are summarized. Then, a community-by-community examination of development compatibility with the flight operations of Westover is presented, based on the regional trends, existing conditions, and the AICUZ land use compatibility standards.

6.1 Regional Socioeconomic Trends

Within the region, important changes are now taking place that will impact citizens, the landscape, the economy, and various governmental institutions that will set priorities and policies in the coming years. A brief overview of trends in the regional economy will help to establish a framework on which recommendations to the surrounding communities of Westover can be made. The most important changes include:

1. A shift in the region's economy from a manufacturing to a service base.
2. The potential for economic development due to an ample supply of land and access to local, national, and international markets.
3. An increase in low density development.
4. Efforts to achieve greater levels of regional cooperation and decision making emerging from the communities.

6.2 Effects of International and National Trends on Local Economies

Following national trends, there has been an overall shift from a manufacturing- to a service-based economy. In this region, manufacturing once dominated the economy, employing 29 percent of the work force as recently as 1980. However, by 1989, one quarter of the region's manufacturing jobs had been lost. Major plant closings in Springfield accounted for 9,500 of the total jobs lost, and downtown office vacancies reached an all-time high.

As a result of these difficult economic times, attracting and retaining business and industry has become a priority for all communities in the region. Chief among the resources in the region is the availability of industrial park land and an excellent transportation network that includes Westover. At the same time, new international trade agreements have forced local businesses to increase efforts in international trade. The Pioneer Valley is situated such that one-third of the total US population can be reached by overnight delivery by land. Westover, offering full customs clearance, is seen by many as a gateway to increased domestic and international trade.

6.3 Increases in Residential Development

Another regional trend affecting the communities around Westover is the continual increase in the amount of land devoted to residential development. Between 1981 and 1986, over 7,000 acres of land in the region were consumed for residential or commercial development. Housing, whether single family or multifamily, is the most prevalent use of the region's land. Using 1985 statistics, eleven percent of the total land area in the Pioneer Valley was dedicated to residential development. For communities surrounding Westover, this has meant an increase in development incompatible with Accident Potential Zones and noise contours.

The numbers below represent an estimation of the number of persons that live within excessive noise contours and APZs. These noise contours represent areas that are affected by noise levels exceeding 65 Ldn. It is important to note that the numbers of people affected by noise contours and APZs cannot be added because the areas overlap. As Figure 7 in Section 4.5 indicated, the noise contours generally follow the APZs, with contours greater than 70 Ldn contained almost entirely within APZ I and II.

Noise Contours

LDN	Population
65 - 70	3,550
70 - 75	1,320
75 +	234
TOTAL	5,104

Accident Potential Zones

APZ	Population
II	3,610
I	710
TOTAL	4,320

As noted in Section 4, individual reactions to noise can vary widely for a given noise level. Using data from the Texas Aeronautics Commission and the 1994 FAA Part 150 study, the percent of the population who would be highly annoyed can be estimated for each noise contour. For example, at 65 Ldn, fifteen to twenty-eight percent of the affected population would be highly annoyed. At 75 Ldn, twenty-five to fifty-seven percent would be highly annoyed. This is a measure of the number of persons who are likely to voice complaints about the noise levels.

6.4 Projected Population

As Table 14 indicates, the population of the five communities adjacent to Westover is not expected to increase significantly. However, this does not mean that there will be no new residential growth in the region. The regional trend, like the national, has been toward smaller and smaller household sizes and an increasing elderly population. These demographic trends suggest two possible scenarios: (1) elders remain in their homes and new homes are needed for younger families; and (2) elders will look for alternative housing in the region and new elderly housing, nursing homes, and retirement communities will be built. Therefore, new residential development is anticipated in the communities surrounding Westover despite the modest projected increases in population. Figure 8 shows the population change in the region from 1980 to 1990.

Table 14. Population Projections

	1980	1990	2000	2010
Chicopee	55,112	56,632	57,200	56,386
Granby	5,380	5,565	5,500	5,158
Ludlow	18,150	18,820	19,235	18,729
South Hadley	16,399	16,685	16,507	16,223
Springfield	152,319	156,983	158,102	158,668
West Springfield	27,042	27,537	27,063	25,759

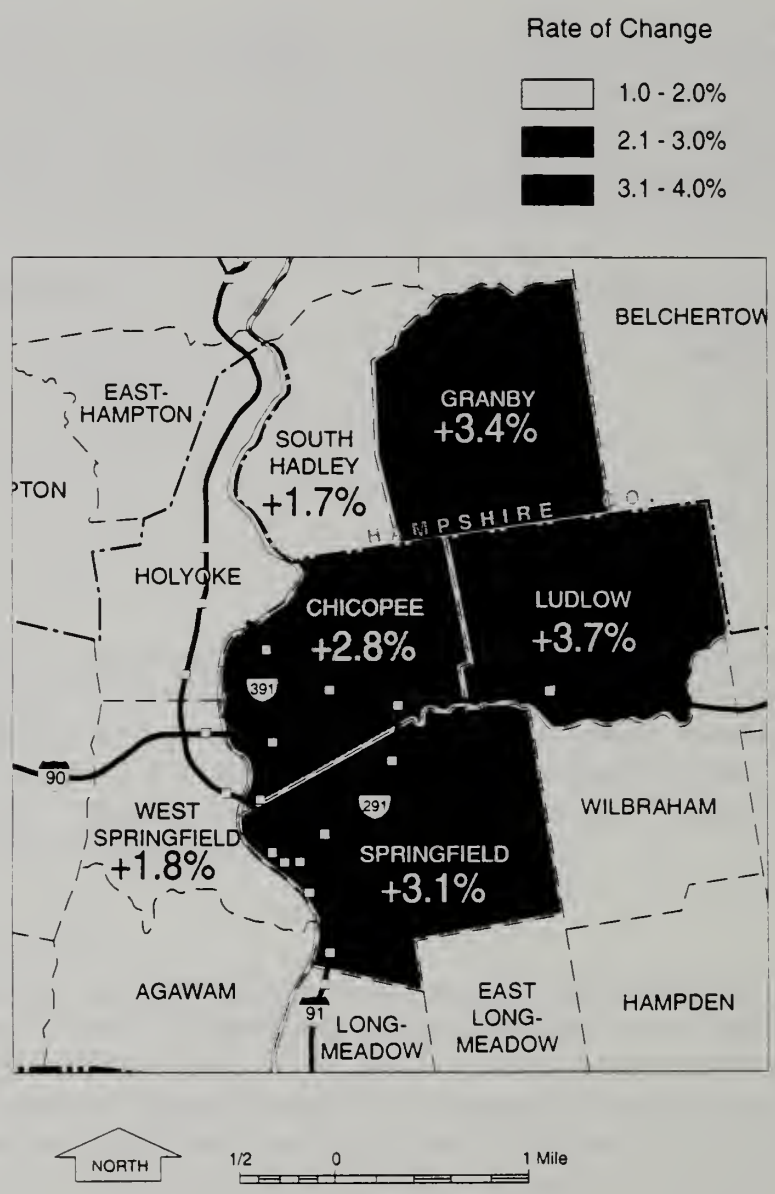


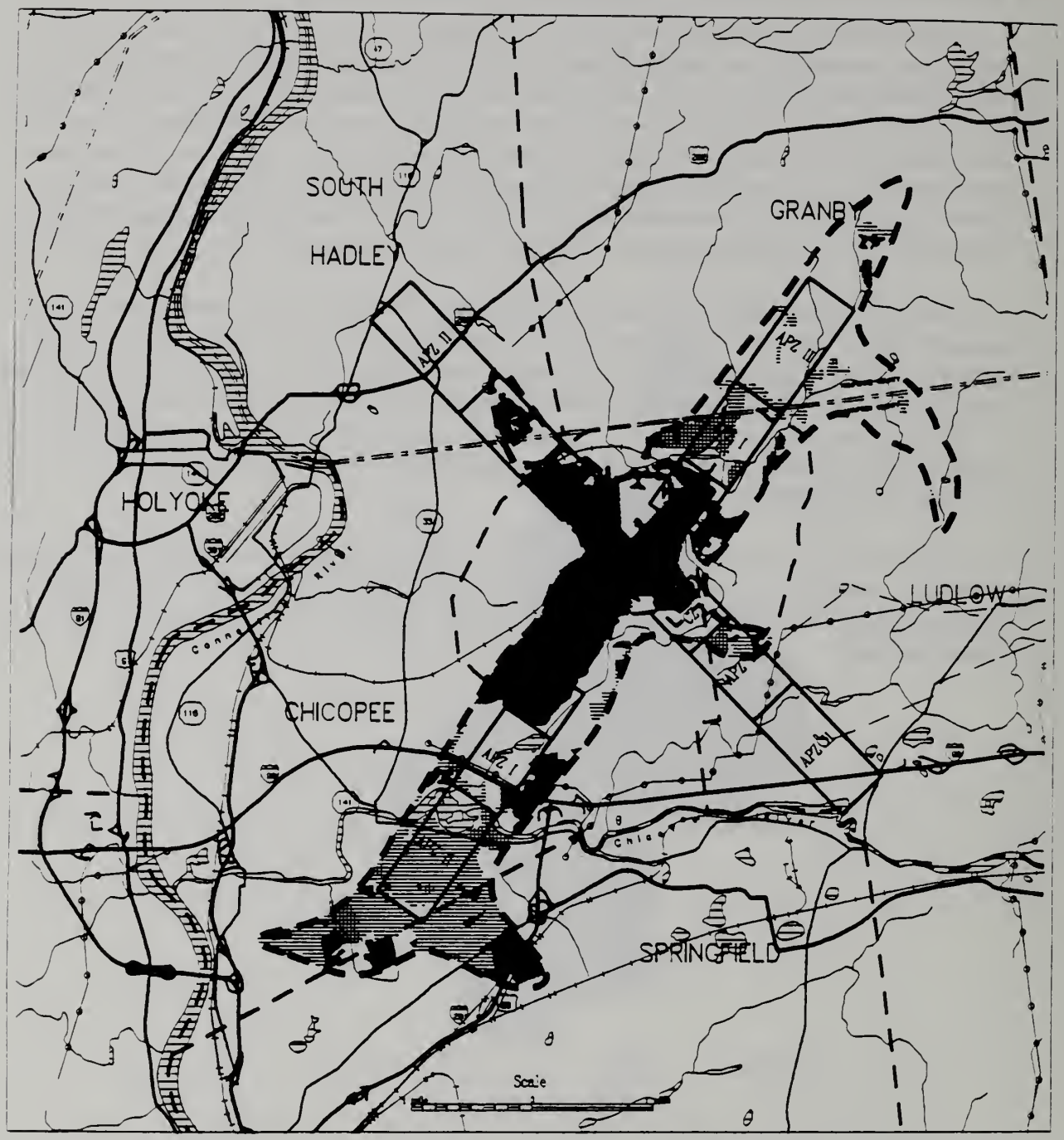
Figure 8. 1980 - 1990 Population Change Map

6.5 Identifying Incompatible Development In Each Community

Based on the regional trends discussed above, two important conclusions may be drawn about the future of the communities surrounding Westover. First of all, Westover is likely to remain an important part of the regional economy, and the advantages it offers will increase in importance with the expected shift to global markets. Second, more land will be consumed for residential development, and suitable undeveloped land within the APZs and noise contours will face development pressure. In this section, each community will be examined in detail to determine if the existing development and zoning are compatible with the AICUZ recommendations. Also, the amount of undeveloped land that is suitable for development will be calculated to estimate how much future development is likely in APZ I and APZ II.

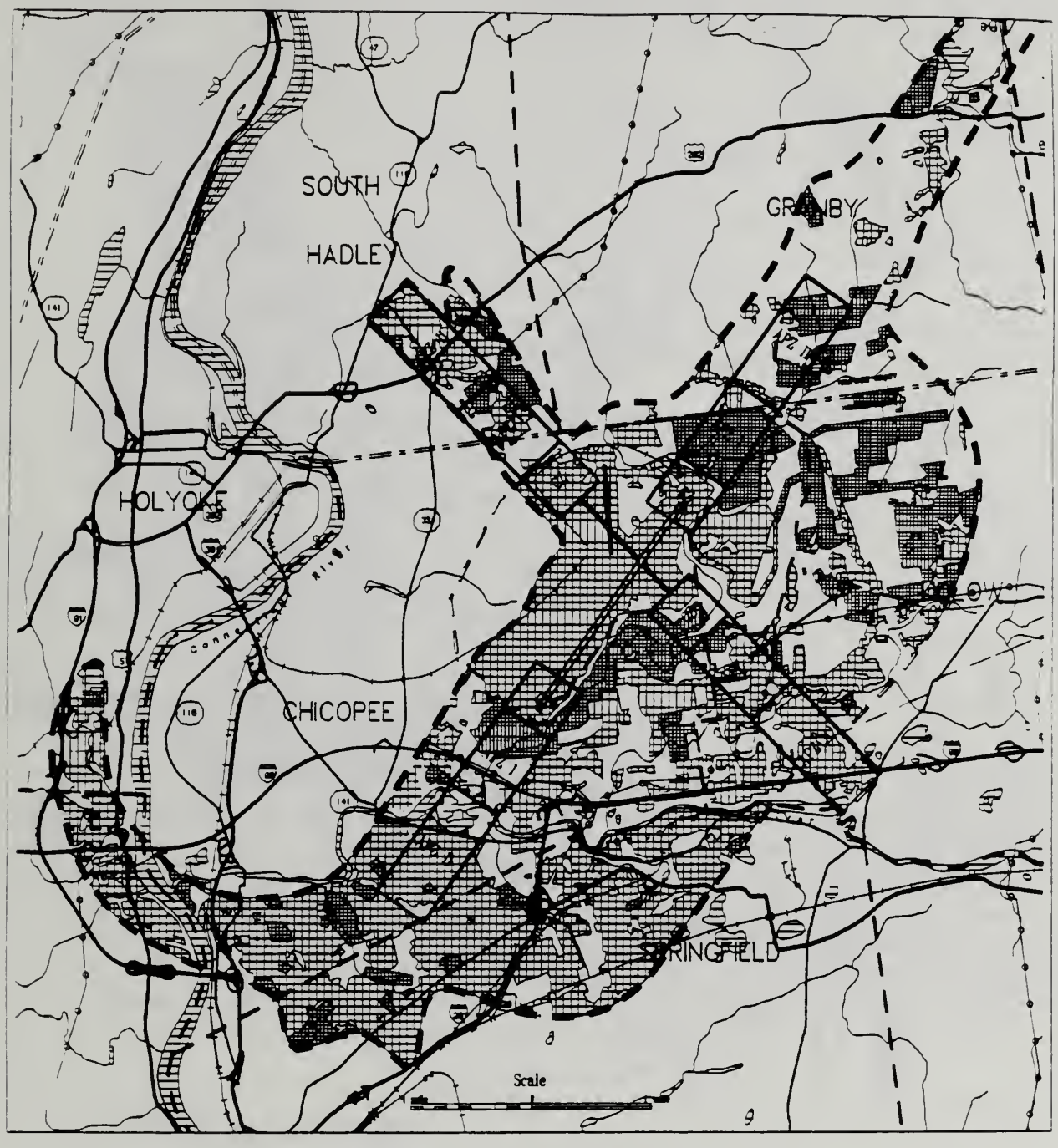
In the AICUZ study for Westover, the Air Force identified height limitations, noise contours, and accident potential zones, all of which are constraints to development. Each zone was then examined to determine the type of exposure people would receive if certain types of land uses developed within them. Key considerations in determining compatible land uses for noise contours and APZs are human density — how many people would be in the zone — and length of time they would be exposed to noise or potential danger. Appendix B contains charts comparing AICUZ recommendations with zoning in each of the impacted communities.

In order to determine the total acreage of developable land, the Pioneer Valley Planning Commission developed a series of maps indicating flood plains, slopes over 15 percent, wetlands, protected open space, and soils for the affected areas. Figures 9, 10, and 11 demonstrate some of the results of these spatial analyses.



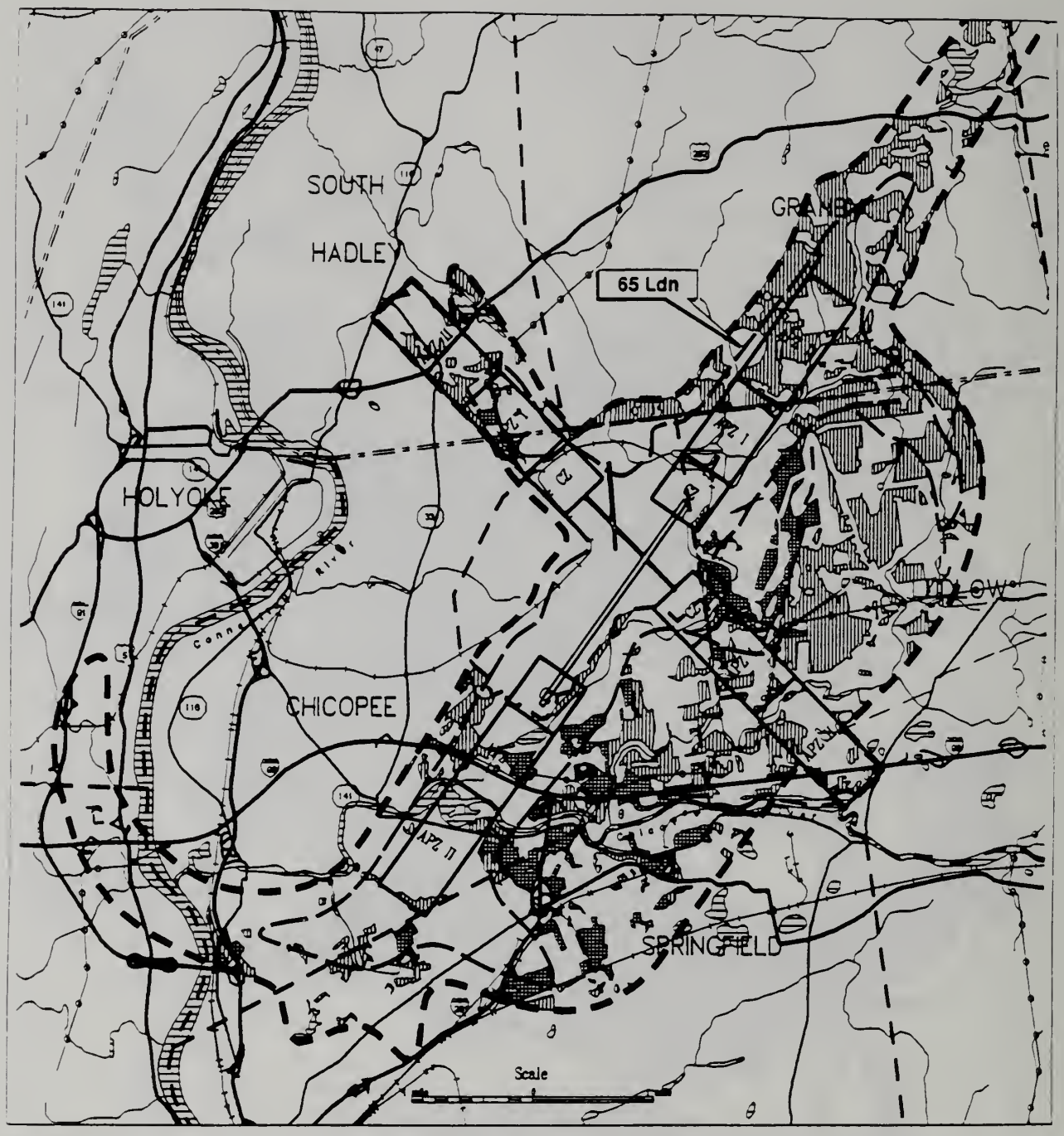
(MacConnell, 1985, UMass)

Figure 9. 1985 Land Use Within the 65 Ldn Contour



Protected and Recreational Open Space (MassGIS)
Developed Land (MacConnell, 1985, UMass)

Figure 10. Committed Lands Within the 60 Ldn Contour



Residential/Agriculture
Commercial/Business
Industrial

Figure 11. Present Zoning of Under-Developed, Unrestricted Lands Greater Than 1 Acre in Size Within 60 Ldn

What follows below is a review of by-laws, ordinances, and plans in the study communities. West Springfield is not included in these analyses because the town has no land within the 65 or greater Ldn contour and no land within the APZs, as indicated in Figure 9. Before each community is examined in detail, some general comments can be made. They are:

1. Chapter 40 of the Massachusetts General Laws permits schools, houses of worship, and day care centers by right in all zones. Only dimensional requirements can be set for these uses. These uses are all incompatible with noise contours above 70 Ldn and Accident Potential Zones. Farms and other agricultural activities are also permitted by right on properties of five acres or more. Farms are generally considered compatible with aircraft activity. However, case law has interpreted such uses as riding stables to be agricultural uses. These types of activities can draw significant numbers of people and need to be examined carefully to determine compatibility.
2. None of the communities in the study had provided for any recognition of the existence of Westover Airport in their zoning by-laws and ordinances, subdivision requirements, or any other planning documents examined.
3. The four communities in the study affected by Accident Potential Zones allow residential development within them. Ludlow and Chicopee allow multifamily residential development.
4. It is not always possible to determine whether a specific land use, identified by the AICUZ as incompatible, would actually be allowed in a given community because not every use is listed in a zoning document exactly the same way. For example, the AICUZ list of uses refers to "places of assembly", but few zoning documents do. For the purposes of this review, a reasonable interpretation of each category of use was compared to the AICUZ list.

6.5.1 Chicopee

The City of Chicopee is composed of 23.8 square miles or about 15,258 acres of land. The city's zoning ordinance allows single unit residential development in both APZs and within noise contours 65 - 80 Ldn. Lot sizes can go as low as one quarter of an acre. Multifamily housing is also allowed in the APZs and noise contours. Group quarters are allowed in APZ II and within the 70 - 80 Ldn contours by Special Permit. Various manufacturing uses are allowed by Special Permit within the 65 - 80 Ldn. Hospitals and nursing homes are allowed by right within the 65 - 70 Ldn and APZ II and by Special Permit in APZ I and within 70 - 80 Ldn. The northern section of APZ II is dominated by the Chicopee River. However, single family residential and some multifamily is prevalent in the Chicopee Falls area. Commercial areas can be found along Butler Avenue, Beauchamp Terrace, Watson Street, Wildemere Street, and St. James Avenue. Saint Patrick's Church lies within the APZ II.

Chicopee, Southwest Approach:

APZ I		APZ II	
Total Acreage	344	Total Acreage	479
Current Land Use		Current Land Use	
Residential (Single Family)	22 acres	Residential (Single Family)	290 acres
Residential (Multifamily)	1 acre	Residential (Multifamily)	70 acres
Recreation/Open Space	29 acres	Commercial	12 acres
Government/Institution	3 acres	Institutional	9 acres
Industrial	11 acres	Open Space	28 acres
		Farmland	14 acres
Total Vacant Land	202 acres	Total Vacant Land	70 acres
Land Suitable for Development	19 acres	Land Suitable for Development	33 acres
Current Zoning	Industrial	Current Zoning	Business B
	Residential		Residential A & B

6.5.2 Granby

Granby allows residential uses in both APZs and all noise contours 65 - 80 Ldn. It also allows multi-family and group quarter housing by Special Permit. Hospitals, nursing homes, recreational, and entertainment facilities are also allowed by Special Permit.

Of all the communities adjacent to Westover, Granby has the most undeveloped land within APZ I, APZ II, and noise contours. With the exception of some residential with multi-unit dwelling, general business zones, and industrial districts, the majority of the Town of Granby is zoned Residence A. Within a Residence A zone, the following uses, prohibited by AICUZ, are permitted:

Single family detached housing
Elderly/handicapped housing
Accessory buildings
Philanthropic organizations
Hospitals
Nursing homes
Museums

Land use maps indicate residential development within the Sherwood Drive and Acrebrook Drive area. Residents in the area are exposed to noise levels of 75 Ldn. Undeveloped parcels are present here, allowing for future growth. Single family dwelling units can also be found along East and West Streets.

APZ II begins near the intersection of Tilley and West Streets. It extends past Taylor Street, running parallel to Stony Brook. The northern boundary extends across and reaches south, intersecting Taylor Street until it meets APZ I at East Street. The area is also zoned Residence A.

Land use maps indicate scattered residential development along West Street and a commercial section by Town Line Automotive. The Dufresne Recreational Area can be found within APZ II as well, with open space, agricultural, and residential uses. Much undeveloped land lies below Taylor Street and above the recreation area. Wetlands around the Stony Brook account for some of the undeveloped land.

Finally, a significant land area within the Town of Granby is exposed to noise levels between 60 and 65 Ldn. Uses within these noise contours are predominantly agricultural and undeveloped acreage with some recreational and residential uses along School and Chicopee Streets. The Cooks Cove, Page Pond, and Hillbrook area of Granby are characterized by 100-year flood plains and wetlands.

Granby, Northeast Approach:

APZ I		APZ II	
Total acreage	60	Total acreage	479
Current Land Use		Current Land Use	
Residential	27 acres	Residential	32 acres
		Commercial	2 acres
		Recreation	40 acres
		Farmland	221 acres
Total Vacant Land	33 acres	Total Vacant Land	405 acres
Land Suitable for Development	13 acres	Land Suitable for Development	139 acres
Current Zoning	Residential	Current Zoning	Residential

6.5.3 Ludlow

Although most of the area within Ludlow's APZs and noise contours is zoned for residential use, most of the other uses that are identified by the AICUZ report as incompatible are also allowed. These include multifamily residential, places of public assembly, hospitals, nursing homes, and recreational facilities. In addition, the Ludlow landfill is within the APZs. Currently, portions of the community lie within the Clear Zone, APZ I, APZ II, and noise contours between 65 and 75 Ldn. In APZ I, there is heavy commercial and industrial development along Moody Street. Residential development is relatively dense in that area.

APZ I

Total Acreage	315
Current Land Use	
Single Family Residential	160 acres
Multifamily Residential	9 acres
Commercial	54 acres
Industrial	26 acres
Open Space	3 acres
Total Vacant Land	64 acres
Land Suitable for Development	50 acres
Current zoning	Residential

APZ II

Total Acreage	482
Current Land Use	
Single Family Residential	292 acres
Multifamily Residential	15 acres
Commercial	22 acres
Industrial	14 acres
Total Vacant Land	139 acres
Land Suitable for Development	80 acres
Current Zoning	Residential A and B
	Business A and B
	Industrial A

6.5.4 South Hadley

The areas within APZs I and II and 65 - 70 Ldn are zoned for residential use, with minimum acre requirements set at one-quarter. South Hadley does not allow residential development in 70 - 75 Ldn and has no land in higher noise contours. Some manufacturing uses are allowed by Special Permit. The town has one elementary school within the APZ II.

The area of town which is contained within APZ I begins at South Hadley's southern boundary. It extends north, intersecting New Ludlow Road and reaches as far as Lyman Terrace. The northern portion of APZ I extends from this point to Old Lyman Road and travels back towards the Chicopee/South Hadley border.

APZ II encompasses an area traveling from the northern boundary of APZ I to Brigham Road, intersecting Granby Road and extending as far as Hildreth Avenue. From here it reaches back to McKinley and Washington Avenue. Finally, it extends toward Willimansett and Route 33 as far as Old Lyman Road. Zoning Districts within APZ II include RA 2, BA 1, Industrial and RA 1.

APZ I

Total Acreage	212
Current Land Use	
Residential	5 acres
Industrial	64 acres
Institutional	24 acres
Farmland	3 acres
Land Suitable for Development	zero (0)

APZ II

Total Acreage	482
Current Land Use	
Residential	259 acres
Commercial	5 acres
Industrial	17 acres
Institutional	64 acres
Open Space	15 acres
Farmland	10 acres
Land Suitable for Development	zero (0)

6.5.5 Springfield

Springfield has only a very small amount of land affected by noise contours 65 - 70 Ldn and 70 - 75 Ldn, and no land within an APZ. All of the land in question is residential with allowable acreage of one-quarter acre. Duplex housing is allowed by Special Permit. No other uses are allowed. Maximum heights of 400 feet and 300 feet are allowed in the Business C and Riverfront Districts, respectively.

APZ II

Total Acreage _____ 3

Current Land Use
Residential _____ 3 acres

Total Vacant Land _____ Zero (0)

RECOMMENDED ACTION STRATEGIES

Having determined the degree to which existing development in the WJLUS communities is compatible with operations at Westover Air Reserve Base, recommendations will now be made for minimizing future incompatibilities as well as mitigating existing incompatibilities.

7.1 Assessing Potential Development Controls

A variety of planning tools exist to encourage compatible development patterns in the environs of airports. The communities abutting Westover face a special challenge because much of the land negatively impacted by the airport is already developed with incompatible uses. There is no single solution to these problems. However, a coordinated set of policies and control measures can go a long way toward minimizing negative impacts and preventing future incompatible development. While it is not possible to achieve total compatibility, the opportunity to develop and implement preventive and remedial programs does exist. What follows is a description of those development measures and policies that were evaluated for use in the Westover Air Reserve Base environs.

Building Codes Building codes can establish construction standards for noise attenuation. Typically, the standards are associated with the building envelope — walls, roofs, and windows. Building codes work well to eliminate or significantly reduce the negative impacts of noise. Of course, in rural and suburban settings where homeowners expect to be able to use their yards, interior noise attenuation will not completely satisfy the needs of homeowners. However, building codes should not be overlooked as at least a partial solution to noise problems even in rural and suburban areas. A detailed list of recommended construction standards can be found in Appendix E of the 1990 AICUZ Report.

In Massachusetts, building codes are set by the Commonwealth. Contrary to popular belief, a community cannot enact its own codes even if they are stricter than Commonwealth codes. In order for codes to be changed, a community would have to petition the Commonwealth. However, those municipalities with identified noise contours would have an excellent case on which to base any request for building code modification.

The community boards with whom this option was discussed were uniformly skeptical. Chief among their concerns was cost to the homeowner and the assumption that any developer would simply pass along added cost to the purchaser. However, it should be recognized that the community at large often pays a price in terms of reduced taxation when homeowners have their taxes abated due to high noise. In addition, it is the homeowner who suffers most if high construction standards are not met and who receives the greatest benefit from noise attenuation building standards. The homeowner would also receive the benefits of added thermal insulation and enhanced real estate values that would offset the initial cost of sound insulation.

Overlay Zoning Zoning is a form of police power that enables governments to enact ordinances protecting the public health, safety, and welfare. It provides the major means of controlling land use in local communities. Where outright zoning changes are not feasible because of the extent of existing development, overlay zoning can be used. Overlay zones allow the underlying zoning to remain in place,

while special uses are protected or prohibited. This will avoid the problem of making existing uses non-conforming, but will not in any way suggest that they are currently compatible with noise contours or Accident Potential Zones. Most communities are familiar with overlay zoning in the form of flood plain districts. A sample overlay zone, an Airbase Compatibility District, is contained in Appendix C. Since it is from another part of the country and different legal restrictions apply, it is provided as a suggestion only. A sample Overlay Height Zoning Ordinance is provided in Appendix C as well.

Concern has been raised in the participating communities about the takings issue. The fear is either that such an overlay district would interfere with a property owner's right to develop his or her property for economic gain or would constitute an unjust interference with private property. However, the takings clause protects private property only from those ordinances which *do not substantially advance legitimate community interests or deny an owner any economically viable use of the land.*

Land Acquisition A fee-simple purchase of incompatible land in the vicinity of an airport is, of course, the most effective method for insuring land use compatibility. However, none of the communities surveyed believed it was feasible or even desirable to do this. Most boards believed that if this were necessary, it would be the airport owners who should undertake the purchase of relevant land. The Air Force policy is to purchase land in the Clear Zones only. There is the potential for voluntary land acquisition and relocation for residences exposed to Ldn 70 and greater, subject to approval and funding by the FAA. Section 7.3 details this further.

Legislation to Prohibit Certain Uses Currently, communities do not have the authority to prohibit the development of schools, day care centers, or houses of worship for any reason. In order to prevent such development, communities would have to petition the Massachusetts General Court, utilizing a home rule petition procedure, in order to prohibit these uses in the APZs. The purpose of zoning is to protect the health and safety of the community. For communities with significant land in the APZs, the logic of preventing these uses that attract large numbers of people, often for long periods of time (as in the case of schools), seems clear.

Deed Restrictions for Disclosure This technique informs the public and or a prospective buyer about the existence of a special condition on the subject property. A disclosure can either be advisory or regulatory. Massachusetts law allows anyone who has special, pertinent information on a particular parcel to have that information recorded by the Registrar of Deeds. An example of a disclosure statement can be found in the Appendix C of this report. The sample disclosure is one that is used in the Norfolk, Virginia area as required by local ordinance. It is part of the Realtor's Multiple Listing Service information and is required on lease agreements as well.

Another technique used in the Norfolk area is the use of road maps to inform the public of accident potential or high noise. The contours and zones can be printed on maps produced by the local Realtor's Association and/or the Chamber of Commerce. A cautious buyer with the road map can thus be informed with or without the use of deed disclosures.

Avigation Easement An easement represents the legal right for one property owner to use the land of another, including the trespass of aircraft and its associated impacts, for an agreed upon price and time period. These easements can exist only between a property owner and the "trespasser". The community does not have the power to enter into such agreements.

Transfer of Development Rights The transfer of development rights (TDR) involves a purchase of the development rights in a property and the transferring of those rights to another piece of property. In other words, in exchange for not developing (or developing in a limited way) a piece of property in one area of town, a land owner would be allowed to develop another parcel he or she owned in a different part of town more intensively than under existing zoning. Research indicates that this technique would have no applicability in the areas impacted by Westover noise contours and APZs because of land ownership patterns.

Memorandum Of Agreement Between Impacted Communities Intergovernmental review of projects could be achieved with a Memorandum of Agreement, a land use advisory committee comprised of the communities, the military, the WMDC, the PVPC, and/or other relevant parties. The function would be to facilitate the exchange of information across political lines, examine projects that cross political boundaries, and establish a monitoring body for projects with regional impacts. If established, this committee would continue the work of the WJLUS committees by keeping abreast of policies and planning issues in the communities that affect or are affected by Westover Air Reserve Base operations. The committee would advise local and regional agencies of pertinent information and make efforts to increase public awareness of development issues related to the air facility. A draft Memorandum of Agreement is contained in Appendix C. The limitation of this proposal is the reluctance of local governments in Massachusetts to fully engage in regional activities. Although the experiences of Pioneer Valley Communities has been more positive over the last decade.

Table 15. Land Use Controls Decision Matrix

Technique	Potential for public acceptance	Legal authority rests with community	Effectiveness	Practicality
Building Codes	Skeptical	No/state	Good	Limited
Overlay Zoning	Positive	Yes	Excellent	Excellent
Land Acquisition	Negative	Yes	Excellent	Poor
Legislation to Prohibit Certain Uses	Positive	No/State	Excellent	Excellent
Deed Restrictions/ Disclosure	Skeptical	Yes	Good	Limited
Avigation Easements	Skeptical	No/Individuals	Good	Good
Memorandum of Agreement	Skeptical	Yes	Excellent	Limited
Transfer of Develop Rights	Negative	Yes	Good	Poor

7.2 Recommendations

- The height, noise, and accident potential issues identified in the AICUZ report of 1990 should be considered in all relevant planning decisions. This includes the development of zoning as well as the preparation of master plans, recreation plans, infrastructure expansion programs, and other pertinent development documents.

- A multi-town committee should be established to coordinate efforts to achieve the most optimum possible compatibility between the land use needs of the airport and the communities. The committee would encourage local adoption and implementation of the recommendations produced by the WJLUS and the FAA Part 150 study.

- All impacted communities should petition the Commonwealth for the home rule legislation necessary to prohibit the development of schools, churches, and day care centers within the Accident Potential Zones.

- A joint community report should recommend to the Commonwealth that building codes be estab lished for high-noise-impacted areas around Westover according to Federal Aviation Administration guidelines.

- Overlay zoning districts should be established in areas where there is a preponderance of existing incompatible development that makes re-zoning impractical.

- Performance standards should be used within such overlay districts to ensure that proposed uses do not:
    - release airborne substances such as smoke, dust, and steam which interfere with aircraft operations;
    - emit light which interferes with pilot vision;
    - emit electrical currents which may interfere with communication or navigational equipment; or
    - attract birds or waterfowl.

- Those communities that have public buildings within the noise contours should establish a program for soundproofing these buildings.

- The communities of Granby, South Hadley, and Ludlow should amend their subdivision regulations to require full disclosure for properties within the noise contours and APZs.

- Each community should encourage the use of disclosure statements in real estate rental agreements for properties within the noise contours and APZs.

- Local maps used by planning boards and other boards or committees that have responsibility for land use decisions should indicate locations of APZs and current noise contours. Real estate and Chamber of Commerce maps distributed to the public should also contain the same information.

7.3 Summary of FAA Part 150 Study Recommendations

The FAA Part 150 study was completed in October 1994. This study differs from the WJLUS in a number of ways. The focus of the WJLUS was to determine the present and future effects of Westover on the surrounding communities and to assess development control measures for their effectiveness in limiting future incompatibilities. The FAA Part 150 recommendations also look at land use measures that would limit future incompatibility, but they also address issues of aircraft operation and the possibilities for mitigating existing incompatibilities that are beyond the scope of the WJLUS. The report, "Noise Compatibility Program", produced under the guidance of the WMDC, provides the details of these recommendations.

The FAA Part 150 recommendations are divided into three categories: operational measures that affect aircraft activity directly, land use measures affecting the land surrounding the airfield, and administrative measures affecting monitoring and publicity of the program. The aircraft operation recommendations are aimed at minimizing noise by altering current procedures for runway use, departures, maintenance runups, and nighttime use. The proposals were developed in coordination with the Air Force staff at Westover, but they will need to go through official Air Force and FAA channels for approval. The land use recommendations are linked most closely to the WJLUS recommendations, and they will be discussed in more detail below. Pilot/public awareness and enforcement/monitoring are the major components of the third category of recommendations produced by the FAA Part 150 study. Also included in the administrative measures is the periodic update of noise exposure to determine at what point the projections made in the 1994 study are being met or exceeded and an updated Part 150 is needed.

The two most significant development recommendations in the FAA Part 150 study are the voluntary acquisition and relocation program and the voluntary sound insulation program. The potential for FAA funding exists for these programs as a result of the FAA Part 150 study, whereas similar funding is not available through the WJLUS. If the acquisition program is approved and adequate funding is available, approximately 150 homes exposed to Ldn 70 or above will be eligible for voluntary acquisition and relocation with the FAA contributing 80 percent of the cost. Residences within the 65 Ldn contour and those within the 70 Ldn contour that are not sold under the acquisition program are eligible for a voluntary sound insulation program. Approximately 900 homes are affected. Both programs await FAA approval and funding.

7.4 Actions Taken in the Participating Communities

During the course of the Westover Joint Land Use Study, the PVPC became involved in a complicated zoning change request in the APZ I of the Town of Ludlow. The change requested an increase in residential density in the area of the APZ I that directly abuts the Clear Zone for Westover runway 15/33. Although the change had been approved two years prior by the Ludlow Town Meeting, there was a technical flaw in the rezoning process that kept the door open for negotiation between the town and the developer. While Ludlow could not completely prohibit the development, the town was able to negotiate to add a disclosure clause to the applicable property deeds. A copy of the agreement between the Town of Ludlow and the developer is included in Appendix C.

The Ludlow Town Meeting in 1991 voted to establish an aircraft flight overlay district. The Town Meeting then voted to require notice of a lot's location within an Accident Potential Zone to be on all deeds for subdivision lot sales. Also approved by Town meeting was the proposal to deny siting of hospitals, auditoriums, nursing homes, and places of assembly in the aircraft flight overlay district. In 1993, Ludlow petitioned the General Court of the Commonwealth of Massachusetts for permission to add to the prohibited list: houses of worship, schools, and day care centers. The 1994 Annual Town Meeting passed the by-law adding those uses to the prohibited list as allowed by House Bill #H4755.

The Granby Planning Board worked to create a proposed overlay zoning district to present at Town Meeting in 1992. However, opposition by a group of local residents prevented the proposal from going to the Town Meeting for considerations and action. A special committee was established to review the proposed by-law and make a recommendation to the Planning Board. This committee presented its findings in March, 1993, and the group recommended that the Town not go forward with the new zoning overlay district. Concern over the property values of existing homes contributed to this recommendation, however, the prevailing view expressed was that the new zoning measures would only help future residents of the town and would do little to help current Granby residents who were affected by aircraft noise tied to Westover. Although the proposed overlay district recommended to the Town as as a result of the WJLUS has not been presented, discussed or debated, before town meetings there is always the potential for it to be reevaluated in the future under the guidance of the Granby Planning Board.

In 1991, Chicopee presented a proposed overlay district to the Board of Aldermen, the first step in the approval process. Due to a miscommunication between the City Clerk's office and the Planning Board, the proposal went no further. The legal time in which action must be taken elapsed. The overlay district is on indefinite hold.

Most of the 122 acres of open South Hadley land within the APZs is currently owned by the town's Conservation Commission. Information concerning the APZ designation has been added to the "attribute" file for each affected parcel.

West Springfield participated in the study, but lies outside the noise contours and APZs. Community awareness is the goal for this community.

In terms of specific actions taken by the towns and cities, the results are mixed. However, the WJLUS has focused public attention on the air facility, and the results of this interest are expected to provide long-term regional benefit. When the communities are ready to take action on a particular strategy, the PVPC is prepared to work with them to make it happen.

Following the conclusion of the WJLUS, the Greater Springfield Chamber of Commerce undertook a joint study with the Regional Planning Department of the University of Massachusetts of the combined economic impact of Westover, Barnes Municipal, and Bradley Airports on the Pioneer Valley Region. Participants in the development of the study questions included the PVPC, Western Massachusetts Electric Company, and the Donahue Institute for Governmental Services. Therefore, recognition of the impact of Westover, especially its role as a positive economic force in the Pioneer Valley, has been aided by the three-year Westover Joint Land Use Study. The results of this study can be used for land planning purposes for many years to come.

APPENDIX A

COMMITTEE MEMBERS

WESTOVER JOINT LAND USE STUDY

COMMITTEE APPOINTMENTS

Westover JLUS Participants	Policy Committee Representative/Affiliation	Technical Committee Representative/Affiliation
City of Chicopee	Kenneth Parsons, Jr. Board of Aldermen 594-2077 95 Lawrence Street Chicopee, MA 01020	Betsy Doyon Chicopee Community Development Manager 594-4711 Ext. 251 City Hall/Market Square Chicopee, MA 01013
Town of South Hadley	Joan Rosner Planning Board Chair 534-3360 (w) 116 Main Street South Hadley, MA 01075	George Boyle Town Planner 538-5011 (w) Town Hall South Hadley, MA 01075
Town of Granby	Cindy Watson Selectboard's Designee 467-7674 559 Amherst Road Granby, MA 01033	David Carmen Planning Board 467-9471 14 MaryLyon Drive Granby, MA 01033
Town of Ludlow	Edward Lafayette Board of Selectmen 787-9471 (w) 488 Chapin Street Ludlow, MA 01056	David Irvine Planning Board 583-3501 59 Tower Road Ludlow, MA 01056
City of Springfield		Robert Oakes Principal Planner Planning Department 787-6020 36 Court Street Springfield, MA 01103
Town of West Springfield	Dennis Miles Selectmen's Office 781-7550 26 Central Street W. Springfield, MA 01089	Linda Zayac Planning Board Chair 781-7550 26 Central Street W. Springfield, MA 01089

Westover JLUS Participants	Policy Committee Representative/Affiliation	Technical Committee Representative/Affiliation
Westover Metropolitan Development Corp. (WMDC)	Alan W. Blair WMDC President 593-6421 3911 Pendleton Avenue Chicopee, MA 01022	Duane M. Stinchfield WMDC Airport Manager 593-6614 3911 Pendleton Avenue Chicopee, MA 01022
Pioneer Valley Planning Commission (PVPC)	Timothy Brennan PVPC Executive Director 781-6045 26 Central Street W. Springfield, MA 01089	Timothy Brennan
U.S. Air Force Westover ARB	Col. James P. Czekanski Installation Commander 557-3588 439 AW/CC Westover ARB, MA 01022	Leroy Klink Chief Engineer 557-3813 439 CSG/DE Westover ARB, MA 01022
	Dr. Frank Faulkner Executive Officer 557-2902 439 ABG/CE Westover ARB, MA 01022	Maj. Bill Wells Staff Judge Advocate 557-3513 Building 1850 Westover ARB, MA 01022
	Col. Franklyn Senft Support Group Commander 557-3044 439 SPTG/CC Westover ARB, MA 01022	Jack Moriarty Westover Environmental Engineer 557-2434

APPENDIX B

AICUZ RECOMMENDATIONS COMPARED WITH ZONING - BY COMMUNITY

NOTES FOR THE CHARTS IN APPENDIX B

The following notes apply to all of the charts contained in this appendix.

1. Suggested maximum density 1-2 dwelling units per acre, possibly increased under a Planned Unit Development (PUD) where maximum lot coverage is less than 20 percent.

2. Within each land use category, uses exist where further definition may be needed due to the variation of densities in people and structures. (See Appendix F)

3. The placing of structures, buildings, or above-ground utility lines in the clear zone is subject to severe restrictions. In a majority of the clear zones, these items are prohibited. See AFR 19-9 for specific guidance.

4. No passenger terminals and no major above-ground transmission lines in APZ I.

5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, air pollution.

6. Low-intensity office uses only. Meeting places, auditoriums, etc., not recommended.

7. Excludes chapels.

8. Facilities must be low intensity.

9. Clubhouse not recommended.

10. Small areas for people gathering places are not recommended.

11. a. Although local conditions may require residential use, it is discouraged in Ldn 65-70 and strongly discouraged in Ldn 70-75. The absence of viable alternative development options should be determined and an evaluation indicating that a demonstrated community need for residential use would not be met if development were prohibited in these zones should be conducted prior to approvals.

b. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB (Ldn 65-70) and 30 dB (Ldn 70-75) should be incorporated into building codes and be considered in individual approvals. Normal construction can be expected to provide a NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels.

NOTES - continued

c. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, design and use of berms and barriers can help mitigate outdoor exposure particularly from level sources. Measures that reduce noise at a site should be used whenever practical in preference to measures which only protect interior spaces.

12. Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

13. Measures to achieve NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

14. Measures to achieve NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

15. If noise sensitive, use indicated NLR; if not, use is compatible.

16. No buildings.

17. Land use compatible, provided special sound reinforcement systems are installed.

18. Residential buildings require a NLR of 25.

19. Residential buildings require a NLR of 30.

20. Residential buildings not permitted.

21. Land use not recommended, built if community decides use is necessary, hearing protection devices should be worn by personnel.

CHICOPEE

Chicopee

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Residential												
Household Units												
Single Units/detached	Y	N	Y	Y	Y	25[11]	Y	30[11]	Y	N		N
Single units/semidetached		N	Y	N	Y	25[11]		30[11]		N		N
Single Units/attached row		N	Y	N	Y	25[11]		30[11]		N		N
Two units/side-by-side		N	Y	N	Y	25[11]		30[11]		N		N
Two Units/one above the other		N	Y	N	Y	25[11]		30[11]		N		N
Apartments/walk-up		N	Y	N	Y	25[11]		30[11]		N		N
Apartments/elevator		N		N		25[11]		30[11]		N		N
Group Quarters		N	Y	N	SP	25[11]	Y	30[11]	Y	N		N
Residential Hotels		N	Y?	N		25[11]		30[11]		N		N
Mobile Home Parks or Courts		N		N		N		N		N		N
Transient Lodgings		N	Y	N		25[11]		30[11]		35[11]		N
Other Residential		N		N		25[11]		30[11]		N		N
Manufacturing					SP							
Food & Kindred Products/Manufacturing		N[2]		Y	SP	Y		Y[12]		Y[13]		Y[14]
Textile Mill Products/Manufacturing		N[2]		Y	SP	Y		Y[12]		Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Apparel and Other Finished Products Made from Fabrics, Leather, and Similar Materials/ Manufacturing		N		N[2]	SP	Y		Y[12]		Y[13]		Y[14]
Lumber and Wood Products (Except Furniture)/ Manufacturing		Y[2]		Y	SP	Y		Y[12]		Y[13]		Y[14]
Furniture and Fixtures/ Manufacturing		Y[2]		Y	SP	Y		Y[12]		Y[13]		Y[14]
Paper & Allied Products/ Manufacturing		Y[2]		Y	SP	Y		Y[12]		Y[13]		Y[14]
Printing, Publishing, and Allied Industries		Y[2]		Y	SP	Y		Y[12]		Y[13]		Y[14]
Chemicals and Allied Products/Manufacturing		N		N[2]	SP	Y		Y[12]		Y[13]		Y[14]
Petroleum Refining and Related Industries		N		Y	SP	Y		Y[12]		Y[13]		Y[14]
Manufacturing												
Rubber and Misc. Plastic Products, Manufacturing		N[2]		N[2]	SP	Y		Y[12]		Y[13]		Y[14]
Stone, Clay and Glass Products Manufacturing		N[2]		Y	SP	Y		Y[12]		Y[13]		Y[14]
Primary Metal Industries					SP	Y		Y[12]		Y[13]		Y[14]
Fabricated Metal Products/ Manufacturing		N[2]		Y	SP	Y		Y[12]		Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Professional, Scientific, and Controlling Instruments; Photographic and Optical Goods; Watches and Clocks Manufacturing		N		N[2]		Y		25		30		IV
Miscellaneous Manufacturing		Y[2]		Y[2]		Y		Y[12]		Y[13]		Y[14]
Transportation, Communications and Utilities												
Railroad, Rapid Rail Transit and Street Railroad Transportation		Y[4]		Y		Y		Y[12]		Y[13]		Y[14]
Motor Vehicle Transportation		Y		Y		Y		Y[12]		Y[13]		Y[14]
Aircraft Transportation		Y[4]		Y		Y		Y[12]		Y[13]		Y[14]
Marine Craft Transportation		Y[4]		Y		Y		Y[12]		Y[13]		Y[14]
Highway & Street Right-of-Way		Y		Y		Y		Y[12]		Y[13]		Y[14]
Automobile Parking		Y[4]		Y	Y	Y		Y[12]		Y[13]		Y[14]
Communication		Y[4]		Y		Y		25[15]		30[15]		N
Utilities Needs Interpretation	Y	Y[4]	Y	Y	Y	Y	Y	Y	Y	Y[12]		Y[13]
Other Transportation Communication and Utilities		Y[4]		Y		Y		25[15]		30[15]		N
Trade												
Wholesale Trade		Y[2]	Y	Y	Y	Y		Y[12]		Y[13]		Y[14]
Retail Trade-Building Materials, Hardware and Farm Equipment		Y[2]	Y	Y	Y	Y		Y[12]		Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Retail Trade-General Merchandise		N[2]	Y	Y[2]	Y	Y		25		30		N
Retail Trade-Food		N[2]	Y	Y[2]	Y	Y		25		30		N
Retail Trade-Automotive, Marine Craft, Aircraft and Accessories		Y[2]	Y	Y[2]	Y	Y		25		30		N
Retail Trade-Apparel and Accessories		N[2]	Y	Y[2]	Y	Y		25		30		N
Retail Trade-Furniture, Home Furnishings and Equipment		N[2]	Y	Y[2]	Y	Y		25		30		N
Retail Trade-Eating and Drinking Establishments		N	Y	N[2]	Y	Y		25		30		N
Other Retail Trade		N[2]	Y	Y[2]	Y	Y		25		30		N
Services												
Finance, Insurance and Real Estate Services		N		Y[6]	Y	Y		25		30		N
Personal Services		N		Y[6]		Y		25		30		N
Cemeteries	Y	Y[7]	Y	Y[7]	Y	Y	Y	Y[12]	Y	Y[13]		Y[14, 21]
Business Services		Y[8]	Y	Y[8]	Y	Y		25		30		N
Repair Services		Y[2]	Y	Y	Y	Y		Y[12]		Y[13]		Y[14]
Professional Services		N	Y	Y[6]	Y	Y		25		30		N
Hospitals, Nursing Homes	SP	N	Y	N	Y	25[11]	SP	30[11]	SP	N		N
Other Medical Facilities	SP	N	SP	N	Y	Y	SP	25	SP	30		N
Contract Construction Services		Y[6]	SP	Y	Y	Y		25		30		N

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Governmental Services	Y	N	Y	Y[6]	Y	Y[11]	Y	25[11]		30[11]		N
Educational Services	Y	N	Y	N	Y	2[11]	Y	30[11]		N		N
Miscellaneous Services		N[2]	Y	Y[2]	Y	Y		25		30		N
Cultural, Entertainment and Recreational												
Cultural Activities (Including Churches)	Y	N	Y	N[2]	Y	25[11]	Y	30[11]		N		N
Nature Exhibits		Y[2]		Y	Y	Y[11]		N		N		N
Public Assembly		N		N	Y	Y		N		N		N
Auditoriums, Concert Halls		N	Y	N	Y	25		30		N		N
Outdoor Music Shells, Amphitheaters		N		N	Y	N		N		N		N
Outdoor Sport Arenas, Spectator Sports		N		N	Y	Y[17]		Y[17]		N		N
Amusements		N		Y[8]		Y		Y		N		N
Recreational Activities (Including Golf Courses, Riding Stables, Water Recreation)	Y	Y[8, 9, 10]	Y	Y	Y	Y[11]	Y	25[11]		30[11]		N
Resorts and Group Camps		N	SP	N		Y[11]		Y[11]		N		N
Parks		Y[8]	?	Y[8]		Y[11]		N		N		
Other Cultural, Entertainment and Recreation		Y[9]		Y[9]		Y[11]		Y[11]		N		N
Resource Production and Extraction												
Day Care	Y		Y		Y		Y		Y			

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Agriculture (Except Livestock)	Y	Y	Y	Y	Y	Y[18]	Y	Y[19]	Y	Y[20]		Y[20, 21]
Livestock Farming and Animal Breeding	Y	Y	Y	Y	Y	Y[18]	Y	Y[19]	Y	Y[20]		Y[20, 21]
Agricultural Related Activities	Y	Y[5]	Y	Y	Y	Y[18]	Y	Y[19]	Y	N		N
Forestry Activities and Related Services		Y		Y		Y[18]		Y[19]		Y[20]		Y[20, 21]
Fishing Activities and Related Services		Y[5]		Y		Y		Y		Y		Y
Mining Activities and Related Services		Y[5]		Y		Y		Y		Y		Y
Other Resource Production and Extraction		Y[5]		Y		Y		Y		Y		Y

5/1/91:dl

GRANBY

Granby

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Residential												
Household Units												
Single Units/detached	Y	N	Y	Y	Y	25[11]	Y	30[11]	N	N		N
Single units/semidetached		N		N		25[11]		30[11]		N		N
Single Units/attached row		N		N		25[11]		30[11]		N		N
Two units/side-by-side	SP	N	SP	N	SP	25[11]	SP	30[11]	SP	N		N
Two Units/one above the other	SP	N	SP	N	SP	25[11]	SP	30[11]	SP	N		N
Apartments/walk-up	SP	N	SP	N	SP	25[11]	SP	30[11]	SP	N		N
Apartments/elevator		N		N		25[11]		30[11]		N		N
Group Quarters	SP	N	SP	N	SP	25[11]	SP	30[11]	SP	N		N
Residential Hotels		N		N		25[11]		30[11]		N		N
Mobile Home Parks or Courts		N		N		N		N		N		N
Transient Lodgings		N		N		25[11]		30[11]		35[11]		N
Other Residential		N		N		25[11]		30[11]		N		N
Manufacturing												
Food & Kindred Products/Manufacturing		N[2]		Y		Y		Y[12]		Y[13]		Y[14]
Textile Mill Products/Manufacturing		N[2]		Y		Y		Y[12]		Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Apparel and Other Finished Products Made from Fabrics, Leather, and Similar Materials/ Manufacturing		N		N[2]		Y		Y[12]		Y[13]		Y[14]
Lumber and Wood Products (Except Furniture)/ Manufacturing		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Furniture and Fixtures/ Manufacturing		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Paper & Allied Products/ Manufacturing		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Printing, Publishing, and Allied Industries		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Chemicals and Allied Products/Manufacturing		N		N[2]		Y		Y[12]		Y[13]		Y[14]
Petroleum Refining and Related Industries		N		Y		Y		Y[12]		Y[13]		Y[14]
Manufacturing												
Rubber and Misc. Plastic Products, Manufacturing		N[2]		N[2]		Y		Y[12]		Y[13]		Y[14]
Stone, Clay and Glass Products Manufacturing		N[2]		Y		Y		Y[12]		Y[13]		Y[14]
Primary Metal Industries						Y		Y[12]		Y[13]		Y[14]
Fabricated Metal Products/ Manufacturing		N[2]		Y		Y		Y[12]		Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Professional, Scientific, and Controlling Instruments; Photographic and Optical Goods; Watches and Clocks Manufacturing		N		N[2]		Y		25		30		IV
Miscellaneous Manufacturing		Y[2]		Y[2]		Y		Y[12]		Y[13]		Y[14]
Transportation, Communications and Utilities												
Railroad, Rapid Rail Transit and Street Railroad Transportation		Y[4]		Y		Y		Y[12]		Y[13]		Y[14]
Motor Vehicle Transportation		Y		Y		Y		Y[12]		Y[13]		Y[14]
Aircraft Transportation		Y[4]		Y		Y		Y[12]		Y[13]		Y[14]
Marine Craft Transportation		Y[4]		Y		Y		Y[12]		Y[13]		Y[14]
Highway & Street Right-of-Way		Y		Y		Y		Y[12]		Y[13]		Y[14]
Automobile Parking		Y[4]		Y		Y		Y[12]		Y[13]		Y[14]
Communication		Y[4]		Y		Y		25[15]		30[15]		N
Utilities		Y[4]		Y		Y		Y		Y[12]		Y[13]
Other Transportation Communication and Utilities		Y[4]		Y		Y		25[15]		30[15]		N
Trade												
Wholesale Trade		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Retail Trade-Building Materials, Hardware and Farm Equipment		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Retail Trade-General Merchandise		N[2]		Y[2]		Y		25		30		N
Retail Trade-Food		N[2]		Y[2]		Y		25		30		N
Retail Trade-Automotive, Marine Craft, Aircraft and Accessories		Y[2]		Y[2]		Y		25		30		N
Retail Trade-Apparel and Accessories		N[2]		Y[2]		Y		25		30		N
Retail Trade-Furniture, Home Furnishings and Equipment		N[2]		Y[2]		Y		25		30		N
Retail Trade-Eating and Drinking Establishments		N		N[2]		Y		25		30		N
Other Retail Trade		N[2]		Y[2]		Y		25		30		N
Services												
Finance, Insurance and Real Estate Services		N		Y[6]		Y		25		30		N
Personal Services		N		Y[6]		Y		25		30		N
Cemeteries	SP	Y[7]	SP	Y[7]	SP	Y	SP	Y[12]	SP	Y[13]		Y[14, 21]
Business Services		Y[8]		Y[8]		Y		25		30		N
Repair Services		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Professional Services	SP	N	SP	Y[6]	SP	Y	SP	25	SP	30		N
Hospitals, Nursing Homes	SP	N	SP	N	SP	25[11]	SP	30[11]	SP	N		N
Other Medical Facilities		N		N		Y		25		30		N
Contract Construction Services		Y[6]		Y		Y		25		30		N

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Governmental Services		N		Y[6]		Y[11]		25[11]		30[11]		N
Educational Services (Institutions)	SPA	N	SPA	N	SPA	2[11]	SPA	30[11]	SPA	N		N
Miscellaneous Services		N[2]		Y[2]		Y		25		30		N
Cultural, Entertainment and Recreational												
Cultural Activities (Including Churches)	Y	N	Y	N[2]	Y	25[11]	Y	30[11]	Y	N		N
Nature Exhibits		Y[2]		Y		Y[11]		N		N		N
Public Assembly		N		N		Y		N		N		N
Auditoriums, Concert Halls		N		N		25		30		N		N
Outdoor Music Shells, Amphitheaters		N		N		N		N		N		N
Outdoor Sport Arenas, Spectator Sports		N		N		Y[17]		Y[17]		N		N
Amusements		N		Y[8]		Y		Y		N		N
Recreational Activities (Including Golf Courses, Riding Stables, Water Recreation)	SP	Y[8, 9, 10]	SP	Y	SP	Y[11]	SP	25[11]	SP	30[11]		N
Resorts and Group Camps	SP	N	SP	N	SP	Y[11]	SP	Y[11]	SP	N		N
Parks	SPA	Y[8]	SPA	Y[8]	SPA	Y[11]	SPA	N	SPA	N		
Other Cultural, Entertainment and Recreation	SP	Y[9]	SP	Y[9]	SP	Y[11]	SP	Y[11]	SP	N		N
Resource Production and Extraction												

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Agriculture (Except Livestock)	Y	Y	Y	Y	Y	Y[18]	Y	Y[19]	Y	Y[20]		Y[20, 21]
Livestock Farming and Animal Breeding	Y	Y	Y	Y	Y	Y[18]	Y	Y[19]	Y	Y[20]		Y[20, 21]
Agricultural Related Activities	Y	Y[5]	Y	Y	Y	Y[18]	Y	Y[19]	Y	N		N
Forestry Activities and Related Services	Y	Y	Y	Y	Y	Y[18]	Y	Y[19]	Y	Y[20]		Y[20, 21]
Fishing Activities and Related Services		Y[5]		Y		Y		Y		Y		Y
Mining Activities and Related Services		Y[5]		Y		Y		Y		Y		Y
Other Resource Production and Extraction		Y[5]		Y		Y		Y		Y		Y

NOTE: Commercial landing strip or heliport allowed by SP in both Accident Potential Zones and Noise Zones

How does Granby interpret "Philanthropic Institution" - allowed by SP

5/22/91:dl

LUDLOW

Ludlow

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Residential												
Household Units												
Single Units/detached	Y	N	Y	Y	Y	25[11]	Y	30[11]	Y	N		N
Single units/semidetached		N		N		25[11]		30[11]		N		N
Single Units/attached row		N		N		25[11]		30[11]		N		N
Two units/side-by-side	PA	N	PA	N	PA	25[11]	PA	30[11]	PA	N		N
Two Units/one above the other	PA	N	PA	N	PA	25[11]	PA	30[11]	PA	N		N
Apartments/walk-up		N		N		25[11]		30[11]		N		N
Apartments/elevator		N		N		25[11]		30[11]		N		N
Group Quarters		N		N		25[11]		30[11]		N		N
Residential Hotels		N		N		25[11]		30[11]		N		N
Mobile Home Parks or Courts		N		N		N		N		N		N
Transient Lodgings	SP	N	SP	N	SP	25[11]	SP	30[11]	SP	35[11]		N
Other Residential		N		N		25[11]		30[11]		N		N
Manufacturing												
Food & Kindred Products/Manufacturing		N[2]		Y		Y		Y[12]		Y[13]		Y[14]
Textile Mill Products/Manufacturing		N[2]		Y		Y		Y[12]		Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Apparel and Other Finished Products Made from Fabrics, Leather, and Similar Materials/ Manufacturing		N		N[2]		Y		Y[12]		Y[13]		Y[14]
Lumber and Wood Products (Except Furniture)/ Manufacturing		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Furniture and Fixtures/ Manufacturing		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Paper & Allied Products/ Manufacturing		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Printing, Publishing, and Allied Industries		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Chemicals and Allied Products/Manufacturing		N		N[2]		Y		Y[12]		Y[13]		Y[14]
Petroleum Refining and Related Industries		N		Y		Y		Y[12]		Y[13]		Y[14]
Manufacturing												
Rubber and Misc. Plastic Products, Manufacturing		N[2]		N[2]		Y		Y[12]		Y[13]		Y[14]
Stone, Clay and Glass Products Manufacturing		N[2]		Y		Y		Y[12]		Y[13]		Y[14]
Primary Metal Industries						Y		Y[12]		Y[13]		Y[14]
Fabricated Metal Products/ Manufacturing		N[2]		Y		Y		Y[12]		Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Professional, Scientific, and Controlling Instruments; Photographic and Optical Goods; Watches and Clocks Manufacturing		N		N[2]		Y		25		30		IV
Miscellaneous Manufacturing	Y	Y[2]	Y	Y[2]	Y	Y	Y	Y[12]	N	Y[13]		Y[14]
Transportation, Communications and Utilities												
Railroad, Rapid Rail Transit and Street Railroad Transportation		Y[4]		Y		Y		Y[12]		Y[13]		Y[14]
Motor Vehicle Transportation	Y	Y	Y	Y	Y	Y	Y	Y[12]	Y	Y[13]		Y[14]
Aircraft Transportation	Y	Y[4]	Y	Y	Y	Y	Y	Y[12]	Y	Y[13]		Y[14]
Marine Craft Transportation		Y[4]		Y		Y		Y[12]		Y[13]		Y[14]
Highway & Street Right-of-Way		Y		Y		Y		Y[12]		Y[13]		Y[14]
Automobile Parking		Y[4]		Y		Y		Y[12]		Y[13]		Y[14]
Communication		Y[4]		Y		Y		25[15]		30[15]		N
Utilities	Y	Y[4]	Y	Y	Y	Y	Y	Y	Y	Y[12]	Y	Y[13]
Other Transportation Communication and Utilities		Y[4]		Y		Y		25[15]		30[15]		N
Trade												
Wholesale Trade		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Retail Trade-Building Materials, Hardware and Farm Equipment		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Retail Trade-General Merchandise		N[2]		Y[2]		Y		25		30		N
Retail Trade-Food		N[2]		Y[2]		Y		25		30		N
Retail Trade-Automotive, Marine Craft, Aircraft and Accessories		Y[2]		Y[2]		Y		25		30		N
Retail Trade-Apparel and Accessories		N[2]		Y[2]		Y		25		30		N
Retail Trade-Furniture, Home Furnishings and Equipment		N[2]		Y[2]		Y		25		30		N
Retail Trade-Eating and Drinking Establishments		N		N[2]		Y		25		30		N
Other Retail Trade		N[2]		Y[2]		Y		25		30		N
Services												
Finance, Insurance and Real Estate Services		N		Y[6]		Y		25		30		N
Personal Services		N		Y[6]		Y		25		30		N
Cemeteries		Y[7]		Y[7]		Y		Y[12]		Y[13]		Y[14, 21]
Business Services		Y[8]		Y[8]		Y		25		30		N
Repair Services		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Professional Services		N		Y[6]		Y		25		30		N
Hospitals, Nursing Homes	Y	N	Y	N	Y	25[11]	Y	30[11]	Y	N		N
Other Medical Facilities		N		N		Y		25		30		N
Contract Construction Services		Y[6]		Y		Y		25		30		N

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Governmental Services		N		Y[6]		Y[11]		25[11]		30[11]		N
Educational Services		N		N		2[11]		30[11]		N		N
Miscellaneous Services		N[2]		Y[2]		Y		25		30		N
Cultural, Entertainment and Recreational												
Cultural Activities (Including Churches)	Y	N	Y	N[2]	Y	25[11]	Y	30[11]	Y	N		N
Nature Exhibits		Y[2]		Y		Y[11]		N		N		N
Public Assembly		N		N		Y		N		N		N
Auditoriums, Concert Halls	Y	N	Y	N	Y	25	Y	30	Y	N		N
Outdoor Music Shells, Amphitheaters	Y	N	Y	N	Y	N	Y	N	Y	N		N
Outdoor Sport Arenas, Spectator Sports		N		N		Y[17]		Y[17]		N		N
Amusements	SP	N	SP	Y[8]	SP	Y	SP	Y	SP	N		N
Recreational Activities (Including Golf Courses, Riding Stables, Water Recreation)		Y[8, 9, 10]		Y		Y[11]		25[11]		30[11]		N
Resorts and Group Camps		N		N		Y[11]		Y[11]		N		N
Parks	Y	Y[8]	Y	Y[8]	Y	Y[11]	Y	N	Y	N		
Other Cultural, Entertainment and Recreation		Y[9]		Y[9]		Y[11]		Y[11]		N		N
Resource Production and Extraction												

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Agriculture (Except Livestock)	Y	Y	Y	Y	Y	Y[18]	Y	Y[19]	Y	Y[20]	-	Y[20, 21]
Livestock Farming and Animal Breeding	Y	Y	Y	Y	Y	Y[18]	Y	Y[19]	Y	Y[20]	-	Y[20, 21]
Agricultural Related Activities		Y[5]		Y		Y[18]		Y[19]		N	-	N
Forestry Activities and Related Services		Y		Y		Y[18]		Y[19]		Y[20]	-	Y[20, 21]
Fishing Activities and Related Services		Y[5]		Y		Y		Y		Y	-	Y
Mining Activities and Related Services		Y[5]		Y		Y		Y		Y	-	Y
Other Resource Production and Extraction		Y[5]		Y		Y		Y		Y	-	Y

Smokehouses are allowed in APZ I and II

5/22/91:dl

SOUTH HADLEY

South Hadley

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Residential												
Household Units												
Single Units/detached	Y	N	Y	Y	Y	25[11]	N	30[11]	-	N		N
Single units/semidetached		N		N		25[11]		30[11]	-	N		N
Single Units/attached row		N		N		25[11]		30[11]	-	N		N
Two units/side-by-side	N	N	N	N	N	25[11]	N	30[11]	-	N		N
Two Units/one above the other	N	N	N	N	N	25[11]	N	30[11]	-	N		N
Apartments/walk-up	N	N	N	N	N	25[11]	N	30[11]	-	N		N
Apartments/elevator		N		N		25[11]		30[11]	-	N		N
Group Quarters		N		N		25[11]		30[11]	-	N		N
Residential Hotels		N		N		25[11]		30[11]	-	N		N
Mobile Home Parks or Courts	N	N	N	N	N	N	N	N	N	N		N
Transient Lodgings	N	N	N	N	N	25[11]	N	30[11]	N	35[11]		N
Other Residential		N		N		25[11]		30[11]	-	N		N
Manufacturing												
Food & Kindred Products/Manufacturing	SPR	N[2]	N	Y	N	Y	SPR	Y[12]	-	Y[13]		Y[14]
Textile Mill Products/Manufacturing	SPR	N[2]	N	Y	N	Y	SPR	Y[12]	-	Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Apparel and Other Finished Products Made from Fabrics, Leather, and Similar Materials/ Manufacturing	SPR	N	N	N[2]	N	Y	SPR	Y[12]	-	Y[13]		Y[14]
Lumber and Wood Products (Except Furniture)/ Manufacturing	SPR	Y[2]	N	Y	N	Y	SPR	Y[12]	-	Y[13]		Y[14]
Furniture and Fixtures/ Manufacturing	SPR	Y[2]	N	Y	N	Y	SPR	Y[12]	-	Y[13]		Y[14]
Paper & Allied Products/ Manufacturing	SPR	Y[2]	N	Y	N	Y	SPR	Y[12]	-	Y[13]		Y[14]
Printing, Publishing, and Allied Industries	SPR	Y[2]	N	Y	N	Y	SPR	Y[12]	-	Y[13]		Y[14]
Chemicals and Allied Products/Manufacturing	?	N		N[2]		Y		Y[12]	-	Y[13]		Y[14]
Petroleum Refining and Related Industries	?	N		Y		Y		Y[12]	-	Y[13]		Y[14]
Manufacturing												
Rubber and Misc. Plastic Products, Manufacturing		N[2]		N[2]		Y		Y[12]	-	Y[13]		Y[14]
Stone, Clay and Glass Products Manufacturing		N[2]		Y		Y		Y[12]	-	Y[13]		Y[14]
Primary Metal Industries						Y		Y[12]	-	Y[13]		Y[14]
Fabricated Metal Products/ Manufacturing	SPR	N[2]	N	Y	N	Y	SPR	Y[12]	-	Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Professional, Scientific, and Controlling Instruments; Photographic and Optical Goods; Watches and Clocks Manufacturing	SPR	N	N	N[2]	N	Y	SPR	25	-	30		IV
Miscellaneous Manufacturing	SPR	Y[2]	N	Y[2]	N	Y	SPR	Y[12]	-	Y[13]		Y[14]
Transportation, Communications and Utilities												
Railroad, Rapid Rail Transit and Street Railroad Transportation		Y[4]		Y		Y		Y[12]	-	Y[13]		Y[14]
Motor Vehicle Transportation		Y		Y		Y		Y[12]	-	Y[13]		Y[14]
Aircraft Transportation		Y[4]		Y		Y		Y[12]	-	Y[13]		Y[14]
Marine Craft Transportation		Y[4]		Y		Y		Y[12]	-	Y[13]		Y[14]
Highway & Street Right-of-Way		Y		Y		Y		Y[12]		Y[13]		Y[14]
Automobile Parking		Y[4]		Y		Y		Y[12]	-	Y[13]		Y[14]
Communication		Y[4]		Y		Y		25[15]	-	30[15]		N
Utilities		Y[4]		Y		Y		Y	-	Y[12]		Y[13]
Other Transportation Communication and Utilities		Y[4]		Y		Y		25[15]	-	30[15]		N
Trade												
Wholesale Trade		Y[2]		Y		Y		Y[12]	-	Y[13]		Y[14]
Retail Trade-Building Materials, Hardware and Farm Equipment		Y[2]		Y		Y		Y[12]	-	Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Retail Trade-General Merchandise		N[2]		Y[2]		Y		25	-	30		N
Retail Trade-Food		N[2]		Y[2]		Y		25	-	30		N
Retail Trade-Automotive, Marine Craft, Aircraft and Accessories		Y[2]		Y[2]		Y		25	-	30		N
Retail Trade-Apparel and Accessories		N[2]		Y[2]		Y		25	-	30		N
Retail Trade-Furniture, Home Furnishings and Equipment		N[2]		Y[2]		Y		25	-	30		N
Retail Trade-Eating and Drinking Establishments		N		N[2]		Y		25	-	30		N
Other Retail Trade		N[2]		Y[2]		Y		25	-	30		N
Services												
Finance, Insurance and Real Estate Services		N		Y[6]		Y		25	-	30		N
Personal Services		N		Y[6]		Y		25	-	30		N
Cemeteries		Y[7]		Y[7]		Y		Y[12]	-	Y[13]		Y[14, 21]
Business Services		Y[8]		Y[8]		Y		25	-	30		N
Repair Services		Y[2]		Y		Y		Y[12]	-	Y[13]		Y[14]
Professional Services		N		Y[6]		Y		25	-	30		N
Hospitals, Nursing Homes	N	N	N	N	N	25[11]	N	30[11]	-	N		N
Other Medical Facilities		N		N		Y		25	-	30		N
Contract Construction Services		Y[6]		Y		Y		25	-	30		N

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed Zoning	R'cmd By AICUZ	Allowed Zoning	R'cmd By AICUZ	Allowed Zoning	R'cmd By AICUZ	Allowed Zoning	R'cmd By AICUZ	Allowed Zoning	R'cmd By AICUZ	Allowed Zoning	R'cmd By AICUZ
Governmental Services		N		Y[6]		Y[11]		25[11]		30[11]		N
Educational Services	Y	N	N	N	N	2[11]	Y	30[11]	-	N		N
Miscellaneous Services		N[2]		Y[2]		Y		25	-	30		N
Cultural, Entertainment and Recreational												
Cultural Activities (Including Churches)		N		N[2]		25[11]		30[11]	-	N		N
Nature Exhibits		Y[2]		Y		Y[11]		N	-	N		N
Public Assembly		N		N		Y		N	-	N		N
Auditoriums, Concert Halls		N		N		25		30	-	N		N
Outdoor Music Shells, Amphitheaters	N	N	N	N	N	N	N	N	-	N		N
Outdoor Sport Arenas, Spectator Sports	N	N	N	N	N	Y[17]	N	Y[17]	-	N		N
Amusements	N	N	N	Y[8]	N	Y	N	Y	-	N		N
Recreational Activities (Including Golf Courses, Riding Stables, Water Recreation)		Y[8, 9, 10]		Y		Y[11]		25[11]	-	30[11]		N
Resorts and Group Camps		N		N		Y[11]		Y[11]	-	N		N
Parks		Y[8]		Y[8]		Y[11]		N	-	N		
Other Cultural, Entertainment and Recreation		Y[9]		Y[9]		Y[11]		Y[11]	-	N		N
Resource Production and Extraction												

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed Zoning	R'cmd By AICUZ	Allowed Zoning	R'cmd By AICUZ	Allowed Zoning	R'cmd By AICUZ	Allowed Zoning	R'cmd By AICUZ	Allowed Zoning	R'cmd By AICUZ	Allowed Zoning	R'cmd By AICUZ
Agriculture (Except Livestock)	Y	Y	Y	Y	Y	Y[18]	Y	Y[19]	-	Y[20]		Y[20, 21]
Livestock Farming and Animal Breeding	Y	Y	Y	Y	Y	Y[18]	Y	Y[19]	-	Y[20]		Y[20, 21]
Agricultural Related Activities*	Y	Y[5]	Y	Y	Y	Y[18]	N	Y[19]	-	N		N
Forestry Activities and Related Services		Y		Y		Y[18]		Y[19]	-	Y[20]		Y[20, 21]
Fishing Activities and Related Services		Y[5]		Y		Y		Y	-	Y		Y
Mining Activities and Related Services		Y[5]		Y		Y		Y	-	Y		Y
Other Resource Production and Extraction		Y[5]		Y		Y		Y	-	Y		Y

Provision for landing strip in Industrial B and Agriculture

*Sale of products

5/21/91:dl

SPRINGFIELD

Springfield

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Residential												
Household Units												
Single Units/detached	-	N		Y	Y	25[11]	Y	30[11]	-	N		N
Single units/semidetached	-	N		N	SP	25[11]	SP	30[11]	-	N		N
Single Units/attached row	-	N		N	SP	25[11]	SP	30[11]	-	N		N
Two units/side-by-side	-	N		N	SP	25[11]	SP	30[11]	-	N		N
Two Units/one above the other	-	N		N	Y	25[11]	Y	30[11]	-	N		N
Apartments/walk-up	-	N		N	Y	25[11]	Y	30[11]	-	N		N
Apartments/elevator	-	N		N	Y	25[11]	Y	30[11]	-	N		N
Group Quarters	-	N		N	Y	25[11]	Y	30[11]	-	N		N
Residential Hotels	-	N		N		25[11]		30[11]	-	N		N
Mobile Home Parks or Courts	-	N		N		N		N	-	N		N
Transient Lodgings	-	N		N	Y	25[11]	Y	30[11]	-	35[11]		N
Other Residential	-	N		N		25[11]		30[11]	-	N		N
Manufacturing												
Food & Kindred Products/Manufacturing	-	N[2]		Y		Y		Y[12]	-	Y[13]		Y[14]
Textile Mill Products/Manufacturing	-	N[2]		Y		Y		Y[12]	-	Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Apparel and Other Finished Products Made from Fabrics, Leather, and Similar Materials/ Manufacturing		N		N[2]		Y	Y[12]		Y[13]		Y[14]	
Lumber and Wood Products (Except Furniture)/ Manufacturing		Y[2]		Y		Y	Y[12]		Y[13]		Y[14]	
Furniture and Fixtures/ Manufacturing		Y[2]		Y		Y	Y[12]		Y[13]		Y[14]	
Paper & Allied Products/ Manufacturing		Y[2]		Y		Y	Y[12]		Y[13]		Y[14]	
Printing, Publishing, and Allied Industries		Y[2]		Y		Y	Y[12]		Y[13]		Y[14]	
Chemicals and Allied Products/Manufacturing		N		N[2]		Y	Y[12]		Y[13]		Y[14]	
Petroleum Refining and Related Industries		N		Y		Y	Y[12]		Y[13]		Y[14]	
Manufacturing												
Rubber and Misc. Plastic Products, Manufacturing		N[2]		N[2]		Y	Y[12]		Y[13]		Y[14]	
Stone, Clay and Glass Products Manufacturing		N[2]		Y		Y	Y[12]		Y[13]		Y[14]	
Primary Metal Industries					Y		Y[12]		Y[13]		Y[14]	
Fabricated Metal Products/ Manufacturing		N[2]		Y		Y	Y[12]		Y[13]		Y[14]	

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Professional, Scientific, and Controlling Instruments; Photographic and Optical Goods; Watches and Clocks Manufacturing		N		N[2]		Y		25		30		IV
Miscellaneous Manufacturing		Y[2]		Y[2]	Y	Y	Y	Y[12]		Y[13]		Y[14]
Transportation, Communications and Utilities												
Railroad, Rapid Rail Transit and Street Railroad Transportation		Y[4]		Y	Y	Y	Y	Y[12]		Y[13]		Y[14]
Motor Vehicle Transportation		Y		Y	Y	Y	Y	Y[12]		Y[13]		Y[14]
Aircraft Transportation		Y[4]		Y	Y	Y	Y	Y[12]		Y[13]		Y[14]
Marine Craft Transportation		Y[4]		Y		Y		Y[12]		Y[13]		Y[14]
Highway & Street Right-of-Way		Y		Y	Y	Y	Y	Y[12]		Y[13]		Y[14]
Automobile Parking		Y[4]		Y		Y		Y[12]		Y[13]		Y[14]
Communication		Y[4]		Y	Y	Y	Y	25[15]		30[15]		N
Utilities		Y[4]		Y	Y	Y	Y	Y		Y[12]		Y[13]
Other Transportation Communication and Utilities		Y[4]		Y		Y		25[15]		30[15]		N
Trade												
Wholesale Trade		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Retail Trade-Building Materials, Hardware and Farm Equipment		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Retail Trade-General Merchandise		N[2]		Y[2]	Y	Y	Y	25		30		N
Retail Trade-Food		N[2]		Y[2]	Y	Y	Y	25		30		N
Retail Trade-Automotive, Marine Craft, Aircraft and Accessories		Y[2]		Y[2]		Y		25		30		N
Retail Trade-Apparel and Accessories		N[2]		Y[2]		Y		25		30		N
Retail Trade-Furniture, Home Furnishings and Equipment		N[2]		Y[2]		Y		25		30		N
Retail Trade-Eating and Drinking Establishments		N		N[2]		Y		25		30		N
Other Retail Trade		N[2]		Y[2]	Y	Y	Y	25		30		N
Services												
Finance, Insurance and Real Estate Services		N		Y[6]		Y		25		30		N
Personal Services		N		Y[6]		Y		25		30		N
Cemeteries		Y[7]		Y[7]		Y		Y[12]		Y[13]		Y[14, 21]
Business Services		Y[8]		Y[8]		Y		25		30		N
Repair Services		Y[2]		Y		Y		Y[12]		Y[13]		Y[14]
Professional Services		N		Y[6]	Y	Y	Y	25		30		N
Hospitals, Nursing Homes		N		N	Y	25[11]	Y	30[11]		N		N
Other Medical Facilities		N		N	Y	Y	Y	25		30		N
Contract Construction Services		Y[6]		Y		Y	25			30		N

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Governmental Services		N		Y[6]		Y[11]		25[11]		30[11]		N
Educational Services		N		N	Y	2[11]	Y	30[11]		N		N
Miscellaneous Services		N[2]		Y[2]		Y		25		30		N
Cultural, Entertainment and Recreational												
Cultural Activities (Including Churches)		N		N[2]		25[11]		30[11]		N		N
Nature Exhibits		Y[2]		Y		Y[11]		N		N		N
Public Assembly		N		N		Y		N		N		N
Auditoriums, Concert Halls		N		N		25		30		N		N
Outdoor Music Shells, Amphitheaters		N		N		N		N		N		N
Outdoor Sport Arenas, Spectator Sports		N		N		Y[17]		Y[17]		N		N
Amusements		N		Y[8]		Y		Y		N		N
Recreational Activities (Including Golf Courses, Riding Stables, Water Recreation)		Y[8, 9, 10]		Y		Y[11]		25[11]		30[11]		N
Resorts and Group Camps		N		N		Y[11]		Y[11]		N		N
Parks		Y[8]		Y[8]		Y[11]		N		N		
Other Cultural, Entertainment and Recreation		Y[9]		Y[9]		Y[11]		Y[11]		N		N
Resource Production and Extraction												

LAND USE	ACCIDENT POTENTIAL ZONES				NOISE ZONES							
	APZ I		APZ II		65-70 Ldn		70-75 Ldn		75-80 Ldn		80+	
Name	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ	Allowed By Zoning	R'cmd By AICUZ
Agriculture (Except Livestock)		Y		Y		Y[18]		Y[19]		Y[20]		Y[20, 21]
Livestock Farming and Animal Breeding		Y		Y		Y[18]		Y[19]		Y[20]		Y[20, 21]
Agricultural Related Activities		Y[5]		Y		Y[18]		Y[19]		N		N
Forestry Activities and Related Services		Y		Y		Y[18]		Y[19]		Y[20]		Y[20, 21]
Fishing Activities and Related Services		Y[5]		Y		Y		Y		Y		Y
Mining Activities and Related Services		Y[5]		Y		Y		Y		Y		Y
Other Resource Production and Extraction		Y[5]		Y		Y		Y		Y		Y

5/22/91:dl

APPENDIX C

SAMPLE BY-LAWS, DISCLOSURE FORMS & AGREEMENTS

** The sample Airbase Compatibility District By-Law uses the following terms which differ from those used in the Westover Joint Land Use Study:

Sample By-Law	WJLUS
Safety Zone I	APZ I
Safety Zone II	APZ II
DNL-1 Noise Level Zone I	>65 Ldn Noise Contour

OVERLAY ZONING

SAMPLE DISTRICT ZONING OVERLAY

Section 603. ACD. Airbase Compatibility Districts

603.1 Types of Districts

There are hereby created Airbase Compatibility Districts for certain areas impacted by the Air Force Base. The pupose of these districts is to maximize the safety of land use and minimize the affect of aircraft noise to promote land use compatibility.

These districts are further divided and shown on the official zoning map as follows:

APZ-1, Safety Zone I
APZ-2, Safety Zone II
DNL-1, Day-Night Noise Level Zone I

603.2 Restrictions Within the Airbase Compatibility Districts

The five airbase compatibility districts are "overlay" zones, imposing supplemental land use and development regulations on the affected primary (underlay) zones. Property owners or land users should consult both the text of this Article and the Official Zoning Map to determine the location of properties in question and the limitations imposed thereon by this Article.

603.3 Land Use

The use of land within these zones shall be subject to the following safety and performance standards and the requirements of Table IV. Where permitted uses listed in Table IV are at variance with the applicable primary zoning district within which they are proposed, the more restrictive shall apply.

603.4 Safety Requirement Standards

The concentration of persons per use shall be in compliance with Table III.

(1) Maximum Number of Persons - The maximum number of persons per use shall be a function of the number of hours of operation per day of the use and shall be expressed on an acre per hour basis. Further, a structure or use or contiguous structure or use, shall not accommodate a gathering of individuals, including employees and non-employees, that would result in an average density of greater than 25 persons per acre per hour during a 24-hour period

or that would exceed 50 persons per acre at any given time.

Such limitations shall be a special condition of the issuance of a building permit and certificate of occupancy. The occupant of any such premises shall not permit such limitations to be exceeded. The premises shall thereafter continuously be posted with a form of notice of said limitations, as prescribed by the Building Official.

(2) Concentrations of Persons Per Acre Standard

Table III

Concentrations of Persons
Per Acre Standard

Hours of Operation Per Day	Maximum Persons Allowed Per Acre/During Each Hour
24	25
23	26
22	27
21	28
20	30
19	31
18	33
17	35
16	37
15	40
14	42
13	46
12 or less	50

(3) Formula - The maximum persons per acre per hour for the duration of time that persons are expected to be on site during a 24-hour period may be determined as follows:

a. Average densities of persons per hour during a 24-hour period are determined by calculating the number of persons per acre expected on a site, multiplying by the number of hours they will be on the site, and dividing the total by 24.

Example #1: One 8-hour shift of 30 workers on a one-acre site.

30 persons expected X 8 hours on site = 240

$\frac{240}{24 \text{ hours}}$ = average density of 10 persons per acre per hour during a 24-hour period

Example #2: Two 8-hour shifts of 30 workers on a 1-acre site.

30 persons expected X 16 hours on site = 480

$\frac{480}{24 \text{ hours}}$ = average density of 20 persons per acre per hour during a 24-hour period

b. The maximum number of persons allowed per acre per hour is calculated by dividing 24 hours by the number of hours persons will be on the site, and multiplying the result by 25 persons per acre per hour.

Example: A use on a 1-acre site has two 8-hour shifts.

$\frac{24 \text{ hours}}{16 \text{ hours}}$ X 25 persons = 37.5 maximum

603.5 Prohibited Use

All uses indicated by a NO in the applicable subzone column of Table IV are expressly prohibited.

603.6 Non-conforming Uses

The regulations prescribed by this Section shall not be construed to require the removal, lowering or other change or alteration of any structure or use not conforming to the regulations as of the effective date hereof, or otherwise interfere with the continuance of any non-conforming use. Nothing herein contained shall require any change in the construction, alteration or intended use of any structure, the construction or alteration of which has begun or plans for residential subdivision plats which have been filed with the Building Official prior to the effective date of this Ordinance.

603.7 Permits

Building permits and sign permits shall be required for all construction, in accord with Article XII.

(1) Future Uses. Each application for a building permit shall indicate the purpose for which the permit is desired, with sufficient particularity to determine whether the resulting use or structure would conform to the regulations herein prescribed.

(2) Existing Uses. Any existing non-conforming use or structure may be replaced, substantially altered, or rebuilt in accord with the permit requirements of Article XII; provided such non-conforming use would not: (a) create a flight hazard or use not authorized by this Ordinance; or (b) permit a non-conforming use or structure to be made or become a greater hazard to air navigation or less compatible in use than it was on the effective date of this Ordinance, or than it is when the application for a permit is made.

603.8 Variance

The Board of Adjustment shall have the power to grant variances to the Safety Requirement Standards of this Article and to authorize the issuance of variance permits therefor as defined in Section 1214 of this Ordinance; provided that the Commander of the Air Force Base, or his designee, shall be notified of any variance being requested and shall be asked for comments on such requests.

TABLE IV

AIRFIELD COMPATIBILITY DISTRICT (ACD) USE REGULATIONS

Land Use Category	APZ-1	APZ-2	CNL-1 65-70 DB *
RESIDENTIAL			
Single-family and Mobile Homes*	NO	YES	25
Single-family**	NO	NO	25
Multi-family Dwelling***	NO	NO	25
Permanent Residence Mobile Home Parks/Courts	NO	NO	25
Transient Lodging - Hotels, Motels	NO	NO	25
INDUSTRIAL/MANUFACTURING			
Food & Kindred Products	NO	YES(1)	YES
Textile Mill Products	NO	YES(1)	YES
Apparel	NO	NO	YES
Lumber & Wood Products	YES(1)	YES(1)	YES
Furniture & Fixtures	YES(1)	YES(1)	YES
Paper & Allied Products	YES(1)	YES(1)	YES
Printing, Publishing	YES(1)	YES(1)	YES
Chemicals & Allied Products	NO	NO	YES
Petroleum Refining & Related Indust.	NO	YES(1)	YES
Rubber & Misc. Plastic	NO	NO	YES
Stone, Clay & Glass Products	NO	YES(1)	YES
Primary Metal Industries	NO	YES(1)	YES
Fabricated Metal Products	NO	YES(1)	YES
Professional, Scientific & Controlling Instruments	NO	NO	YES
Misc. Manufacturing	YES(1)	YES(1)	YES
TRANSPORTATION, COMMUNICATIONS & UTILITIES			
Railroad, Rapid Rail	YES(2)	YES	YES
Motor Vehicle Transportation	YES(2)	YES	YES
Aircraft Transportation	YES(2)	YES	YES
Highway & Street ROW	YES(2)	YES	YES
Auto Parking	YES(2)	YES	YES
Communications	YES(2)	YES	YES
Utilities	YES(2)	YES	YES
Landfills & Hazardous Waste Facilities	NO	NO	YES
COMMERCIAL/RETAIL TRADE			
Wholesale Trade	YES(1)	YES(1)	YES
Building Materials-Retail	YES(1)	YES(1)	YES
General Merchandise-Retail			
Less than 10,000 sq. ft. per acre	YES(1,11)	YES(1,11)	YES
Over 10,000 sq. ft. per acre	NO	NO	YES
Food Retail-Groceries	NO	NO	YES
Other Food Retail	YES(1)	YES(1)	YES
Automotive, Marine, Aviation-Retail	YES(1)	YES(1)	YES
Apparel & Accessories-Retail	NO	YES(1)	YES
Furniture, Home Furnishings-Retail	NO	YES(1)	YES
Eating & Drinking Places	NO	YES(1)	YES
SERVICES			
Finance, Insurance & Real Estate	YES(1)	YES(1,3)	YES
Personal Services	YES(1)	YES(1,3)	YES
Cemeteries	YES(1,3,4)	YES(1,3,4)	YES
Business Services	YES(1)	YES(1,3)	YES
Warehousing & Storage Services	YES(1)	YES(1)	YES
Explosives Storage	NO	NO	YES
Repair Services	YES(1,3)	YES(1,3)	YES
Medical & Other Health Services	NO	NO	YES(10)
Hospital	NO	NO	25
Legal Services	YES(1)	YES(1,3)	YES(10)
Other Professional Services	YES(1)	YES(1,3)	YES(10)
Contract Construction Services	YES(1)	YES(1,3)	YES(10)
Government Services	NO	YES(1,3)	YES(10)
Educational Services	NO	NO	YES(10)
Religious Activities	NO	NO	YES(10)
CULTURAL, ENTERTAINMENT AND RECREATION			
Cultural Activities	NO	NO	YES(10)
Nature Exhibitions	YES(5)	YES(5)	NA
Entertainment Facilities Indoor/outdoor	NO	NO	NA
Indoor/Outdoor Sports Activities	NO	YES(5,6,7)	NA
Water & Other Recreation Areas	YES(5)	YES(5)	NA
Resort & Group Camps	NO	NO	NA
Parks & Golf Courses	YES(5)	YES(5)	NA
RESOURCE PRODUCTION, EXTRACTION AND OPEN LAND			
Agriculture Related Activities	YES	YES	NA
Dairy & Livestock Farms (9)	YES	YES	NA
Forestry & Mining	YES	YES	NA
Fishing & Water Areas, Hunting	YES	YES	NA
Permanent Open Space	YES	YES	NA

* This ordinance is specific to the City of Other jurisdictions may have more than one noise contour to consider.

TABLE IV (continued)

(1) Uses compatible only if they do not result in a large concentration of people. A large concentration of people is defined as a gathering of individuals in an area that would result in an average density of greater than 25 people per acre per hour during a 24-hour period, or a single event that would result in the gathering of 50 persons per acre at any time. (See Safety Requirement Standards)

In addition, the following factors need to be considered: Labor intensity, structural coverage, explosive characteristics, air pollution, size of establishment, peak period (including shopper/visitor) concentrations.

(2) No passenger terminals and no major above ground transmission lines.

(3) Meeting places, auditoriums, etc. not allowed.

(4) Excludes chapels.

(5) Facilities must comply with Safety Requirement Standards and no high-intensity use or facilities, such as structured playgrounds, ballfields, or picnic pavilions.

(6) Clubhouse not allowed.

(7) Concentrated rings with large classes not allowed.

(8) Includes livestock grazing but excludes feedlots and intensive animal husbandry.

(9) Includes feedlots and intensive animal husbandry.

(10) Measures to achieve NLR of 25 db must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(11) General Merchandise - Retail compatible provided that individual shops do not exceed 2,500 sq. ft. and that not more than 4 shops per acre are allowed.

(12) Measures to achieve NLR of 30 db must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

TABLE IV (continued)

(13) Measures to achieve NLR of 35 db must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.

NOTES:

(a) * Less than or equal to two (2) dwelling units per acre.
** More than two (2) dwelling units per acre.
*** Including duplex, triplex and quadruplex.

(b) Computations for Residential Density Include Roads and Right-of-Ways.

(c) DB = Decibels

(d) 25, 30 or 35 db - Measures to achieve NLR 25, 30 or 35 db must be incorporated into design and construction of structures in accord with the Noise Level Reduction Guidelines, contained in the Air Installation Compatible Use Zone Study, for Air Force Base, latest edition.

(e) NA = Not applicable

OVERLAY HEIGHT ZONING ORDINANCE

AS AN IMPORTANT ELEMENT OF THIS AIR FORCE BASE JOINT LAND USE STUDY, THIS SUGGESTED HEIGHT ZONING ORDINANCE IS INTENDED FOR REVIEW, MODIFICATION, AND ADOPTION BY EACH AFFECTED JURISDICTION, AS PREVIOUSLY DEFINED IN THIS STUDY. IT IS BASED ON FAA ADVISORY CIRCULAR 150-5190-4A. A MODEL ZONING ORDINANCE TO LIMIT HEIGHT OF OBJECTS AROUND AIRPORTS.

IT IS RECOMMENDED THAT THE PROVISIONS OF THIS ORDINANCE BE ADOPTED BY EACH AFFECTED JURISDICTION SEPARATELY AS AN OVERLAY DISTRICT OR ZONE, AS APPROPRIATE, CREATING A SPECIAL ZONING CLASS AS REQUIRED FOR IMPLEMENTATION.

EACH OVERLAY ZONE WILL THEN CONSTITUTE AN ORDINANCE REGULATING AND RESTRICTING THE HEIGHT OF STRUCTURES AND OBJECTS OF NATURAL GROWTH, AND OTHERWISE REGULATING THE USE OF PROPERTY, IN THE VICINITY OF THE AIR FORCE BASE BY DEFINING THE APPROPRIATE AIRSPACE SURFACES AS CONTAINED IN AFR 86-14 AND FAR PART 77, SUBPART C; BY CONVERTING THESE SURFACES TO APPROPRIATE ZONES AND ESTABLISHING THE BOUNDARIES THEREOF; PROVIDING FOR CHANGES IN THE RESTRICTIONS AND BOUNDARIES OF SUCH ZONES; DEFINING CERTAIN TERMS USED HEREIN; AND REFERRING TO THE AIR FORCE BASE ZONING MAP, WHICH IS INCORPORATED IN AND MADE A PART OF THIS SUGGESTED ORDINANCE.

Each ordinance will be established in pursuance of the authority conferred under Chapter 1? of the Code of Laws 55-13-10 for the purpose of promoting the health, safety, and general welfare of the inhabitants of the State of by preventing the creation or establishment of obstructions and hazards to air navigation, thereby protecting the lives and property of users of the Air Force Base and of occupants of land in its vicinity and preventing destruction or impairment of the utility of the Airfield and the public investment therein.

SECTION I: SHORT TITLE

Each Ordinance can be known and may be cited as the "Overlay Height Zoning Ordinance for the areas surrounding the Air Force Base."

SECTION II: DEFINITIONS

1. Airfield means the Air Force Base.

2. Established Airfield Elevation - 46 feet above mean sea level.

3. Primary Surface - This surface defines the limits of the obstruction clearance requirements in the immediate vicinity of the landing area. The primary surface comprises surfaces of the runways, runway shoulders, and lateral safety zones. The length of the primary surface is the same as the runway. The width of the primary surface for each runway is 2,000 feet, or 1,000 feet on each side of the runway centerline.

4. Clear Zone Surface - This surface defines the limits of the obstruction clearance requirements in the vicinity contiguous to the end of the primary surface. The length and width of a clear zone surface is 3,000 feet by 3,000 feet for each runway.

5. Approach-Departure Clearance Surface - This surface is symmetrical about the runway centerline extended, begins as an inclined plane (glide angle) 200 feet beyond each end of the primary surface at the centerline elevation of the runway end, and extends for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 along the extended runway (glide angle) centerline until it reaches an elevation of 500 feet above the established airfield elevation. It then continues horizontally at this elevation to a point 50,000 feet from the start of the glide angle. The width of this surface at the runway end is 2,000 feet; it flares uniformly, and the width at 50,000 feet is 16,000 feet.

6. Inner Horizontal Surface - This surface is a plane, oval in shape at a height of 150 feet above the established airfield elevation. It is constructed by scribing an arc with a radius of 7,500 feet above the centerline at the end of the runway and interconnecting these arcs with tangents.

7. Conical Surface - This is an inclined surface extending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established air field elevation. The slope of the conical surface is 20:1.

8. Outer Horizontal Surface - This surface is a plane located 500 feet above the established airfield elevation. It extends for a horizontal distance of 30,000 feet from the outer periphery of the conical surface.

9. Transitional Surfaces - These surfaces connect the primary surfaces, clear zone surfaces, and approach-departure clearance surfaces to the outer horizontal surface, conical surface, other horizontal surface, or other transitional surfaces. The slope of the transitional surface is 7:1 outward and upward at right angles to the runway centerline. To determine the elevation for the beginning of the transitional surface slope at any point along the lateral boundary of the primary surface, including the clear zone, draw a line from this point to the runway centerline. This line will be at right angles to the runway axis. The elevation at the runway centerline is the elevation for the beginning of the 7:1 slope.

10. Hazard to Air Navigation - An obstruction determined to have a substantial adverse effect on the safe and efficient utilization of the navigable airspace.

11. Height - For the purpose of determining the height limits in all zones set forth in this Ordinance and shown on the zoning map, the datum shall be mean sea level elevation unless otherwise specified.

12. Nonconforming Use - Any pre-existing structure, object of natural growth, or use of land that is inconsistent with the provisions of this Ordinance or an amendment thereto.

13. Tree - Any object of natural growth.

14. Structure - An object, including a mobile object, constructed or installed by man, including, but without limitation, buildings, towers, cranes, smokestacks, earth formation, and overhead transmission lines.

15. Obstruction - Any structure, growth, or other object, including a mobile object, which exceeds a limiting height set forth in this Ordinance.

16. Person - An individual, firm, partnership, corporation, company, association, joint stock association, or government entity; includes a trustee, a receiver, an assignee, or a similar representative of any of them.

SECTION III: AIRFIELD ZONES AND ZONING MAP

In order to carry out the provisions of this Ordinance, the appropriate airspace surfaces as contained in AFR 86-14 and FAR Part 77, Subpart C and defined in Section II of this Ordinance are hereby converted to zones. These established zones include the land lying beneath the associated airspace surface which include the clear zone, approach/departure, inner horizontal, conical, outer horizontal, and transitional surfaces. Such zones are shown on the Air Force Base Zoning Map consisting of one sheet, and dated October 1993, which is attached to this Ordinance and made a part hereof. An area located in more than one of the following zones is considered to be only in the zone with the more restrictive height limitation. The various zones are hereby established and include the clear zone, approach/departure, inner horizontal, conical, outer horizontal, and transitional zones.

SECTION IV: AIRFIELD ZONE HEIGHT LIMITATIONS

Except as otherwise provided in this Ordinance, no structure shall be erected, altered, or maintained, and no tree shall be allowed to grow in any zone created by this Ordinance, to a height in excess of the applicable height herein established for such zone. Such applicable height limitations are hereby established for each of the zones in question, as follows:

1. Clear Zone - This zone defines the limits of the obstruction clearance requirements in the vicinity contiguous to the end of the primary surface. The length and width of a clear zone is 3,000 feet by 3,000 feet for each runway. Each clear zone should be kept free from all development and use to the greatest extent possible.

2. Approach-Departure Clearance Zone - This zone is symmetrical about the runway centerline extended, begins as an inclined plane (glide angle) 200 feet beyond each end of the primary surface at the centerline elevation of the runway end, and extends for 50,000 feet. The slope of the approach-departure clearance zone is 50:1 along the extended runway (glide angle) centerline until it reaches an elevation of 500 feet above the established airfield elevation, which is calculated to be 546 feet above mean sea level. It then continues horizontally at this elevation to a point 50,000 feet from the start of the glide angle. The width of this zone at the runway end is 2,000 feet; it flares uniformly, and the width at 50,000 feet is 16,000 feet.

3. Inner Horizontal Zone - This zone is a plane, oval in shape at a height of 150 feet above the established airfield elevation, which is calculated to be 196 feet above mean sea level. It is constructed by scribing an arc with a radius of 7,500 feet above the centerline at the end of the runway and interconnecting these arcs with tangents.

4. Conical Zone - This is an inclined zone extending outward and upward from the outer periphery of the inner horizontal zone for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation, which is calculated to be 546 feet above mean sea level. The slope of conical zone is 20:1.

5. Outer Horizontal Zone - This zone is a plane located 500 feet above the established airfield elevation, which is calculated to be 546 feet above mean sea level. It extends for a horizontal distance of 30,000 feet from the outer periphery of the conical zone.

6. Transitional Zones - These zones connect the primary surfaces, clear zones, and approach-departure clearance zones to the outer horizontal zone, conical zone, other horizontal zone, or other transitional zones. The slope of the transitional zone is 7:1 outward and upward at right angles to the runway centerline. To determine the elevation for the beginning of the transitional zone slope at any point along the lateral boundary of the primary surface, including the clear zone, draw a line from this point to the runway centerline. This line will be at right angles to the runway axis. The elevation at the runway centerline is the elevation for the beginning of the 7:1 slope.

7. Excepted Height Limitations - Nothing in this Ordinance shall be construed as prohibiting the construction or maintenance of any structure, or growth of any tree, to a height up to 50 feet above the surface of the land. Such potential obstructions should be resolved through the purchase of property in easement, or in fee simple.

SECTION V: USE RESTRICTION

Notwithstanding any other provisions of this Ordinance, no use may be made of land or water within any zone established by this Ordinance in such a manner as to create electrical interference with navigational signals or radio communication between the Airfield and aircraft, make it difficult for pilots to distinguish between airport lights and others, result in glare in the eyes of pilots using the airport, impair visibility in the vicinity of the Airfield, create bird strike hazards, or otherwise in any way endanger or interfere with the landing, takeoff, or maneuvering of aircraft intending to use the Airfield.

SECTION VI: NONCONFORMING USES

1. Regulations Not Retroactive - The regulations prescribed in this Ordinance shall not be construed to require the removal, lowering, or other change or alteration of any structure or tree not conforming to the regulations as the effective date of this Ordinance, or otherwise interfere with the continuance of a nonconforming use. Nothing contained herein shall require any change in the construction, alteration, or intended use of any structure, the construction or alteration of which was begun prior to the effective date of this Ordinance, and is diligently prosecuted and completed within one year thereof.

2. Obstruction Marking and Lighting - Notwithstanding the preceding provision of this section, the owner of any existing nonconforming structure or tree is hereby required to permit the installation, operation, and maintenance thereon of such markers and lights as shall be deemed necessary by the Zoning Administrator to indicate to the operators of aircraft in the vicinity of the airport the presence of such airport obstruction. See FAA Advisory Circular 70-7460-1H for further guidance.

SECTION VII: PERMITS

1. Future Uses - Hereunder, no material change shall be made in the use of land, no structure shall be erected or otherwise established, and no tree shall be planted in any zone hereby created unless a permit therefor shall have been applied for and granted. Each application for a permit shall indicate the purpose for which the permit is desired, with sufficient particularity to permit it to be determined whether the resulting use, structure, or tree would conform to the regulations herein prescribed. If such determination is in the affirmative, the permit shall be granted. No permit for a use inconsistent with the provisions of this ordinance shall be granted unless a variance has been approved in accordance with Section VII, 4.

   Nothing contained in any of the foregoing exceptions shall be construed as permitting or intending to permit any construction, or alteration of any structure, or growth of any tree in excess of any of the height limits established by this Ordinance except as set forth in Section IV, 7.

2. Existing Uses - No permit shall be granted that would allow the establishment or creation of an obstruction or permit a nonconforming use, structure, or tree to become a greater hazard to air navigation, than it was on the effective date of this Ordinance or any amendments thereto or than it is when the application for a permit is made. Except as indicated, all applications for such a permit shall be granted.

3. Nonconforming Uses Abandoned or Destroyed - Whenever the Zoning Administrator determines that a nonconforming tree or structure has been abandoned or more than 80 percent torn down, physically deteriorated, or decayed, no permit shall be granted that would allow such structure or tree to exceed the applicable height limit or otherwise deviate from the zoning regulations. Determination will be guided by Federal Emergency Management Agency Standards.

4. Variances - Any person desiring to erect or increase the height of any structure, or permit the growth of any tree, or use property, not in accordance with the regulations prescribed in this Ordinance, may apply to the Zoning Administrator for a variance from such regulations. The application for variance shall be accompanied by a determination from the Federal Aviation Administration as to the effect of the proposal on the operation of air navigation facilities and the safe, efficient use of navigable airspace. Such variances shall be allowed where it is duly found that a literal application or enforcement of the regulations will result in unnecessary hardship and relief granted, will not be contrary to the public interest, will not create a hazard to air navigation, will do substantial justice, and will be in accordance with the spirit of this Ordinance. Additionally, no application for variance to the requirements of this Ordinance may be considered by the Zoning Administrator unless a copy of the application has been furnished to the Air Force Base for advice as to the aeronautical effects of the variance. the Air Force Base Shall respond to the application within 30 days after receipt.

5. Obstruction Marking and Lighting - Any permit or variance granted may, if such action is deemed advisable to effectuate the purpose of this Ordinance and be reasonable in the circumstances, be so conditioned as to require the owner of the structure or tree in question to install, operate, and maintain, at the owner's expense, such markings and lights as may be necessary. If deemed proper by the Zoning Administrator, this condition may be modified to require the owner to permit the installation, operation and maintenance of the necessary markings and lights. FAA Advisory Circular 70-7460-1H provides further guidance to meet this requirement.

SECTION VIII: ENFORCEMENT

It shall be the duty of the Zoning Administrator to administer and enforce the regulations prescribed herein in concert with all local laws and ordinances.

DISCLOSURE FORMS

METRO MLS, INC.

SINGLE FAMILY INPUT FORM
PROPERTY TYPE 1 (SF)

PROPERTY ADDRESS _____
OFFICE NAME _____ # _____ MLS # _____
AGENT NAME _____ # _____ Input Date: __/__/__

*LO (List Office LD) *MSFL % (Mst Svc List Fee) *BBC Y/N (Buyer Broker Comm)

*LA (List Agent #) *MSFS % (Mst Svc Sale Fee) *SBC (Sell Broker Comm)

LA2 (2nd List Agent #) LA2N (2nd List Agent Name) LA2P (2nd List Agent Phone #) +LTYPE (List Type) *SCA Y/N (Spec. Comm.)

*LD (List Date (MM/DD/YY)) *XD (Expire Date (MM/DD/YY)) *LP (List Price) +PC (Photo Code)

*SHOW (Showing instructions.) +LBTYPE (LockBox Type) HL (Home Line #)

*OWNER (Owners Name) *OPH (Owners Phone #) *POSS (Possession)

*STN (Street Number) *STR (Street Name) DIR (Direction) *CIT (City) *ZIP (Zip Code)

*AR (Area) *DIV (Division) *NAM (Subdivision Name) *MPG (Map Page) *MXY (Map Coords)

*LEG (Legal Description) *ZONE (Zoning) *AICUZC (Crash) *AICUZN (Noise)

*BR (# Bedrooms) *RMS (# Rooms) *NC Y/N (New Const) *WF Y/N (Water Front) *PKSPCS (# Park Spaces) +WTRHTR (Water Heater)

*FBA (# Full Baths) *STO (# Stories) *MSTMDL Y/N (Master Model) *FEN Y/N (Fenced) ACR (Approx. # Acres)

HBA (# Half Baths) *FP (# Fireplaces) *YRBLT (Approx. Year Built) SQFT (Approx. Sq.Ft. of Property) LOTF (Approx. Lot Frontage) LOTD (Approx. Depth)

LIVD (Living Room Dimensions) LIVL (Level) MBAL (Approx. Mortgage Balance) MIR (Interest Rate) MLT (Loan Type) MYR (Yrs Remaining)

GRTD (Great Room Dimensions) GRTL (Level) MCOA (Minimum Cash on Assmnt) MPMT (Approx. MortgagePayment) MPI (Payment Incl (T=Tax,I=Ins)) *TAX (Approx. Taxes)

DIND (Dining Room Dimensions) DINL (Level) *MOPOA (Mnthly Prop.Owns' Assn Fees) *PTS (Points paid by Seller)

KITD (Kitchen Dimensions) KITL (Level)

FAMD (Family Room Dimensions) FAML (Level) ROL Y/N (Release of Liab.) *SWR (Type Sewer) +SHS (Senior High School)

MBRD (Master Bed Rm Dimensions) MBRL (Level) SOE Y/N (Sub of Elig.) *WTR (Type Water) OSCH (Other Schools)

REM1 (Remarks Line 1 (Up to 60 characters per line))

REM2 (Remarks Line 2)

REM3 (Remarks Line 3)

REM4 (Remarks Line 4)

REM5 (Remarks Line 5)

* Denotes a REQUIRED field. + Denotes a REQUIRED TABLE field. You must use the appropriate entry from the table:

SHS Senior High School Abrreviations

SCHOOL	ABBREV.	SCHOOL	ABBREV.	SCHOOL	ABBREV
Bayside	BAYSIDE	Kecoughtan	KECOUGH	Southampton	SOHMPTN
Bethel	BETHEL	Kellam	KELLAM	Surry Co.	SURRY
Bruton	BRUTON	Kempsville	KEMPS	Sussex Central	SUSSEX
ST Washington	ST WASH	Lafayette	LAFAYET	Tabb	TABB
Churchland	CHRLND	Lakeland	LAKELND	Tallwood	TALLWD
Cox	COX	Lake Taylor	LK TYLR	Warwick	WARWICK
Deep Creek	DP CRK	Mathews	MATHEWS	Western Branch	W BRNCH
Denbigh	DENBIGH	Maury	MAURY	Windsor	WINDSOR
Ferguson	FERGUSN	Menchville	MENCHVL	Woodrow Wilson	WILSON
First Colonial	1ST COL	Middlesex	MIDLESX	York	YORK
Franklin	FRANKLN	Nansemond Rvr	NAN RVR	Other	OTHER
Gloucester	GLOUSTR	Norview	NORVIEW		
Granby	GRANBY	Ocean Lakes	OCN LKS		
Great Bridge	GR BRDG	Oscar Smith	O SMITH		
Green Run	GR RUN	Phoebus	PHOEBUS		
Greenville Co.	GREENVL	Poquoson	POQUOSN		
Hampton	HAMPTON	Princess Anne	PR ANNE		
IC Norcom	NORCOM	Salem	SALEM		
Indian River	IND RVR	Smithfield	SMTHFLD		

LTYPE Listing Type

ER	Exclusive Right
EA	Exclusive Agency

LBTYPE Lockbox Type

FAN	Fannie Mae Key
FRD	Freddie Mac Key
MET	Metro Multiacc
PEN	Peninsula
HUD	VA/HUD Key
WMS	Williamsburg Multiacc
NON	None
OTH	Other

PC Photo Code

1	Call Listing Office
2	Take Photo
3	New Construction Take Photo
4	Photo Submitted
5	No Photo Required
6	New Construction No Photo

WTRHTR Water Heater

ELE	Electric
GAS	Gas
OIL	Oil
SOLR	Solar
OTHR	Other
NONE	None

Executed this _____ Day of _____, 19 _____ (List Date)
Firm _____ Signature of Seller _____
By Agent _____ Signature of Seller _____

Distribution: White - With original of Standard Listing Agreement and page 2 of Property Type form to listing firm.
Canary - With copy of Standard Listing Agreement and page 2 of Property Type form to seller.
Pink - With copy of Standard Listing Agreement and page 2 of Property Type form to agent.

PT 1 Rev. 3-1-84
Page 1 of 2

GENERAL DISCLOSURE ADDENDUM

(May Be Used *ONLY* With Non-METRO MLS Purchase Agreements)

This document is incorporated by reference into and forms an integral part of the Purchase Agreement (the "Purchase Agreement") dated the_____ day of_____, 19_____ between_____

_____("Buyer") and

_____("Seller") and

_____("Selling Firm") and

_____("Listing Firm") for

all that certain piece, parcel or lot of land described as follows to-wit:_____

_____("Property").

Buyer and Seller acknowledge the following disclosures:

A. **AGENCY DISCLOSURE:** (Initial 1, 2 or 3 AND 4)
Notwithstanding the provisions of the Purchase Agreement relating to the payment of commissions:

1.(_____) The parties confirm that in connection with the transaction contemplated by this Purchase Agreement, the Listing Firm, and the Selling Firm, and their salespersons have acted on behalf of Seller as Seller's agent.

or

2.(_____) The parties confirm that in connection with the transaction contemplated by this Purchase Agreement, the Listing Firm and its salespersons have acted on behalf of Seller as Seller's agent, and the Selling firm and its salespersons, by agreement, have acted on behalf of Buyer as Buyer's agent.

or

3.(_____) The parties confirm that in connection with the transaction contemplated by this Purchase Agreement, the Listing Firm and its salespersons have acted in a dual agency status for both Seller and Buyer, that the parties have consented to this dual representation, and that the Listing Firm will, within applicable ethical and legal limits, act in its clients' best interests.

and

4.(_____) The parties also confirm, with respect to their own representation, that disclosure of the agency relationships described above was made in writing in the DISCLOSURE INFORMATION FORMS attached hereto at the time specific real estate assistance was provided by the brokers named above, or their respective salespersons.

B. **PROPERTY OWNERS' ASSOCIATIONS (POA): Buyer and Seller acknowledge that the Property is_____is not_____** (Initial One) in a community which has mandatory fees of $_____ for the current year and subject to the Virginia Property Owners' Association Act. If the Property is located within such a development, the Act requires the development's property owners' association to provide Seller, within fourteen days of a written request and payment of the appropriate fee, with the required association disclosure packet which Seller shall obtain and provide to Buyer. Cost of preparation fee shall be paid by Seller. The Property Owners' Association Addendum, attached hereto, more fully describes the parties' rights and obligations under the Virginia Property Owners' Association Act and is incorporated by reference into this Purchase Agreement.

C. **CONDOMINIUM RESALE:** Buyer and Seller acknowledge that the Property is_____is not_____ (Initial One) a condominium unit. In the event the Property described herein is a condominium unit being resold by a unit owner other than the condominium developer, or Declarant, then the Condominium Resale Addendum, attached hereto, is incorporated by reference into this Purchase Agreement.

D. **AIRCRAFT NOISE ACCIDENT DISCLOSURE:** Aircraft noise and/or accident zones are subject to change. Buyer and Seller hereby acknowledge that as of the date of this Purchase Agreement the Property is located in an Aircraft Noise Zone_____ and/or Aircraft Accident Zone_____.

E. **ENVIRONMENTAL DISCLOSURE:** The uses and development opportunities of the owner of the Property may be limited if the Property is covered by the Chesapeake Bay Preservation Act, the Clean Water Act, the Virginia Water Control Act or any other federal, state or local regulation concerning the environment. Seller recommends that Buyer investigate this matter to determine the potential impact of the federal, state and local regulations on the Property.

F. **AGENCY INTEREST DISCLOSURE:** Listing salesperson/selling salesperson hereby states, except as otherwise disclosed herein, that neither it nor any member of its family, its firm, any member of its firm, or any entity in which it has an ownership interest intends to acquire the Property. Furthermore, Seller hereby states, except as otherwise disclosed herein, that it is not a licensed real estate agent.

G. **SOUTHEASTERN EXPRESSWAY DISCLOSURE:** The Virginia Department of Transportation has proposed different routes for the proposed Southeastern Expressway. Seller recommends that Buyer investigate this matter to determine whether any of these routes may affect Buyer's use and enjoyment of the Property.

H. **FLOOD PLAIN:** Some properties are located within a designated Flood Plain which may require additional flood insurance. Seller recommends that Buyer investigate this matter to determine whether the Property is located within such a flood plain.

I. **VIRGINIA BEACH WATER CONSERVATION ORDINANCE:** The City of Virginia Beach recently adopted a water conservation ordinance which limits new connections to the public water system and imposes restrictions on the use of water from the public system. If the Property is not currently connected to the public water system, it may or may not be eligible to be connected. If the Property is currently connected to the public water system, that water may not, with certain exceptions, be used for certain uses. If this ordinance affects the Property, Buyer is advised to investigate the effects of this ordinance.

J. **LEAD-BASED PAINT DISCLOSURE:** Properties built prior to 1978 may contain lead-based paint which could affect the health of the residents. If the Property was built prior to 1978, a copy of the signed Lead-Based Paint Poisoning Notice, attached hereto, is incorporated by reference into this Purchase Agreement.

K. **VIRGINIA RESIDENTIAL PROPERTY DISCLOSURE ACT:** The Virginia Residential Property Disclosure Act requires sellers of residential real property beginning July 1, 1993, to either disclose to buyers certain information known to the sellers regarding the condition of the property to be purchased or to provide a disclaimer statement that the property is being sold "as is," except as otherwise provided in the purchase agreement. Seller and Buyer acknowledge that a Residential Property Disclosure Statement _____or a Residential Property Disclaimer Statement _____(initial one), attached hereto and incorporated by reference into this Purchase Agreement, has been provided by Seller to Buyer prior to acceptance of this Purchase Agreement.

Neither the Seller, the Listing Firm, the Selling Firm nor their employees or agents will be held responsible for Buyer's failure to investigate any of the above disclosures' effects on the Property.

DEFAULT: If either Buyer or Seller defaults under this Purchase Agreement, such defaulting party shall be liable for the cash brokerage fee due Listing Firm and Selling Firm and for any other damages and expenses, including reasonable attorneys' fees incurred by the Listing Firm and Selling Firm or non-defaulting party in connection with this transaction or with the enforcement of this Purchase Agreement.

MISCELLANEOUS: Virginia law (Section 43-1 et seq.) permits persons who have performed labor or furnished materials for the construction, removal, repair or improvement of any building or structure to file a lien against the property. This lien may be filed at any time after the work is commenced or the material is furnished, but not later than the earlier of (i) 90 days from the last day of the month in which the labor last performed work or furnished materials or (ii) 90 days from the time the construction, removal, repair or improvement is terminated. Seller warrants that all bills related to any repairs or improvements made to the Property have been paid or will be paid by Seller from the proceeds at closing. AN EFFECTIVE LIEN FOR WORK PERFORMED PRIOR TO THE DATE OF SETTLEMENT MAY BE FILED AFTER SETTLEMENT. LEGAL COUNSEL SHOULD BE CONSULTED.

_____ (Selling Firm)	_____ (Buyer) (Date)
By:_____ (Date)	_____ (Buyer) (Date)
_____ (Listing Firm)	_____ (Seller) (Date)
By:_____ (Date)	_____ (Seller) (Date)

PAA-8 (08/15/93)

METRO M·L·S

EQUAL HOUSING OPPORTUNITY

AGENCY DISCLOSURE AND OTHER CONSUMER DISCLOSURE INFORMATION FORM

AGENCY DISCLOSURE: In compliance with Section 6.3 of The Virginia Real Estate Board Regulations parties to transactions involving real estate should understand the unique and valuable role that real estate brokers and their agents play in marketing real estate. That role has been defined over the years by both law and custom. The following is intended to give you a brief explanation of that role.

1. Brokers and their agents may be employed to represent any party to a real estate transaction.
2. The person the broker and broker's agents represent is usually referred to as the "client" and the other party is usually referred to as the "customer."
3. The broker and broker's agents owe the client duties of disclosure, loyalty and faithfulness. At the same time, brokers and their agents are required to treat all parties to a transaction fairly and in good faith.
4. If a broker represents the seller, the broker and broker's agents may still provide buyers, as customers, with information about properties and available financing, may show them properties, and may assist them in preparing an offer to purchase or option a particular property.
5. Brokers and their agents have a duty to respond accurately to customers' questions, to disclose to customers material information about a particular property of which they have knowledge, and to submit all written offers to purchase, sell, or option a property promptly to both customers and clients without discrimination.
6. A **DUAL AGENCY RELATIONSHIP** arises when the buyer who has a buyer broker relationship with the broker first expresses an interest in viewing or purchasing one of the houses listed by their broker. Brokers and their agents can legally be the agents of both a buyer and the seller in a single transaction, but only with the acknowledgement and consent of both the buyer and the seller as outlined by separate agreement if applicable. Under a **DUAL AGENCY RELATIONSHIP**, broker would endeavor to be impartial and would not disclose to either party facts and information which may have been disclosed to the broker concerning the other party except as may be required by applicable law or regulation.

I (we) acknowledge that I (we) have been provided with a copy of these Agency Disclosures at or prior to the time when specific real estate assistance was first provided, that I (we) understand the information provided, and that the brokerage firm listed below represents (Circle as Appropriate) **SELLER / OPTIONOR / LANDLORD** or **BUYER / OPTIONEE / TENANT.**

OTHER CONSUMER DISCLOSURE INFORMATION:
The following disclosure information is provided to both prospective buyers and sellers. Any of the following disclosures may impact the Buyer's use and/or enjoyment of a property. NEITHER THE SELLER, METRO MLS, INC., THE LISTING FIRM, THE SELLING FIRM NOR THEIR EMPLOYEES OR AGENTS WILL BE HELD RESPONSIBLE FOR BUYER'S FAILURE TO INVESTIGATE ANY OF THESE DISCLOSURES PRIOR TO ENTERING INTO A PURCHASE AGREEMENT.

A. **PROPERTY OWNERS ASSOCIATIONS (POA):** Some properties may belong to a community which has a Property Owner's Association or Homeowners' Association, some of which have mandatory fees, and all are subject to the Virginia Property Owners' Association Act. If a property is located within such a development, the Act requires the development's property owners' association to provide seller, within fourteen days of a written request and payment of the appropriate fee, with the required association disclosure packet which seller shall obtain and provide to buyer.

B. **CONDOMINIUM RESALE:** Some properties may be recorded as a condominium unit and subject to the Virginia Condominium Act. The Act requires sellers to furnish the unit owners' Association Bylaws, as amended, and certain financial and other disclosures to the buyer prior to entering into a binding contract for the sale of the condominium.

C. **AIRCRAFT NOISE/ACCIDENT DISCLOSURE:** All properties are affected by aircraft noise to some degree; however, some properties are located in specific noise and/or accident zones. The livability and/or enjoyment of the property by the owner may be limited if property is adjacent to or situated near an airport or within an aircraft noise and/or accident zone. Aircraft noise and/or accident zones are subject to change.

D. **ENVIRONMENTAL DISCLOSURE:** The use and development opportunities may be limited and health risks may be associated with certain properties if those properties, in their past or present condition, are or were covered by the Chesapeake Bay Preservation Act, the Clean Water Act, the Comprehensive Environmental Response, Compensation and Liability Act, the Virginia Water Control Act, or any other federal, state or local law, regulation or ordinance concerning health, safety or the environment, including but not limited to those laws, regulations and ordinances concerned with (1) radon gas; (2) asbestos; (3) underground storage tanks; (4) aboveground storage tanks; (5) urea formaldehyde; (6) lead-based paint; and (7) electromagnetic fields.

E. **AGENCY INTEREST DISCLOSURE:** a) If a real estate agent knows or should have known that the agent, any member of the agent's family, agent's firm, any member of agent's firm, or any entity in which agent has an ownership interest, is acquiring or attempting to acquire real property through purchase, and the agent is a party to the transaction, the agent must disclose that information to the owner. b) A real estate agent selling property in which the agent has any interest must disclose that the agent is a real estate agent to any purchaser.

F. **SOUTHEASTERN EXPRESSWAY DISCLOSURE:** The Virginia Department of Transportation has proposed different routes for the proposed Southeastern Expressway which may be constructed through portions of Virginia Beach & Chesapeake.

G. **FLOOD PLAIN:** Some properties are located within a designated Flood Plain which may require flood insurance.

H. **WATER CONSERVATION ORDINANCE/RESTRICTIONS:** The City of Virginia Beach recently adopted a water conservation ordinance which limits new connections to the public water system and imposes restrictions on the use of water from the public system. Some properties not currently connected to the public water system may or may not be eligible to be connected. If such property is currently connected to the public water system, that water may not, with certain exceptions, be used for certain uses. Other cities may impose restrictions on water usage from time to time based upon shortages of water availability.

I. **LEAD-BASED PAINT DISCLOSURE:** Properties built prior to 1978 may contain lead-based paint which could affect the health of the residents. The Department of Housing & Urban Development has required a lead-based paint poisoning notification be given to prospective homebuyers who utilize FHA. This rule applies to loans for the purchase of homes built prior to 1978. Contact your local health or environmental office for further information.

J. **VIRGINIA RESIDENTIAL PROPERTY DISCLOSURE ACT:** The Virginia Residential Property Disclosure Act requires the owner of certain residential real property, whenever the property is to be sold or leased with an option to buy, to furnish to the purchaser either (a) a RESIDENTIAL PROPERTY DISCLAIMER STATEMENT stating that the owner makes no representations or warranties as to the condition of the property and that the property is being sold "as is," except as otherwise provided in the purchase agreement, or (b) a RESIDENTIAL PROPERTY DISCLOSURE STATEMENT disclosing defects in the condition of the property actually known by the owner. Certain transfers of residential property are excluded from this requirement.

K. **OCCUPANCY PERMIT PROGRAMS:** Several municipalities have implemented occupancy permit programs which may require the owner of real property subject to such programs to make certain repairs to comply with this program upon sale and/or rental of property. Each municipality will be able to advise you as to whether the property you are interested in is subject to an occupancy permit program and the conditions and requirements of the program.

L. **MECHANICS LIENS:** Virginia law permits persons who have performed labor or furnished materials for the construction, removal, repair or improvement of any building or structure to file a lien against the property. This lien may be filed at any time after the work is commenced or the material is furnished, but not later than the earlier of (i) 90 days from the last day of the month in which the lienor last performed work or furnished materials or (ii) 90 days from the time the construction, removal, repair or improvement is terminated. AN EFFECTIVE LIEN FOR WORK PERFORMED PRIOR TO THE DATE OF SETTLEMENT MAY BE FILED AFTER SETTLEMENT. LEGAL COUNSEL SHOULD BE CONSULTED.

BY YOUR SIGNATURE BELOW YOU ACKNOWLEDGE RECEIPT OF THIS AGENCY DISCLOSURE AND OTHER CONSUMER DISCLOSURE INFORMATION FORM. IF YOU HAVE QUESTIONS AFTER READING THE CONSUMER INFORMATION MATERIAL, YOU MAY SEEK FURTHER INFORMATION FROM THE APPROPRIATE GOVERNMENTAL/CONSUMER AGENCIES OR CONSULT LEGAL COUNSEL.

Signature	Print Name	Date
Signature	Print Name	Date

Brokerage Firm: _____

By: _____ Signature _____ Date

AO 4/15/94

TIDEWATER ASSOCIATION OF REALTORS®
RESIDENTIAL LEASE

REALTOR®

EQUAL HOUSING OPPORTUNITY

THIS LEASE is made on _____ 19_____, between Owner and Tenant jointly and severally, who have agreed as follows

1. **DEFINITIONS:** Whenever the following capitalized words are used in this Lease, they shall have the meanings shown below:

Owner:	Tenant:	Agent: (company) Address	
Premises:			Term:
Starting Date:	Ending Date:	Renewal Period:	Renewal Notice Period
Rent: $ per month	Initial Rent: $	Late Date: days after due date	Late Fee:
Default Interest Rate:	per annum (not to exceed 12%)	Returned Check Charge: $	Default Pet Rent: $
Security Deposit: $	to be held by ☐ Agent or ☐ Owner	Included Utilities:	
Assignment Fee: $	Maximum Occupancy:	Noise Zone:	Accident Zone:

2. **LEASE OF PREMISES:** Owner leases the Premises to Tenant on the following terms for use only as a private dwelling and for occupancy by no more than the Maximum Occupancy. Owner and Tenant agree that this Lease shall be subject to the Virginia Residential Landlord Tenant Act, as modified from time to time (the "VRLTA").

3. **AGENT:** Owner appoints Agent as Owner's agent in connection with this Lease. Agent is authorized to manage the Premises on behalf of Owner, and is authorized to act on behalf of Owner, including for purposes of service of process and receiving and receipting for notices and demands. Any action taken or waiver given by Agent shall be as effective as if taken or given by Owner. Owner and Tenant agree that Agent is an intended beneficiary of this Lease and shall be entitled to enforce this Lease. Tenant acknowledges that this agency relationship was disclosed in this Lease or the application, whichever was given to Tenant first.

4. **TERM:** The Term shall commence on the Starting Date and end on the Ending Date. Unless either party gives the other written notice before the Renewal Notice Period prior to the end of the Term that the notifying party intends to terminate, THE TERM OF THIS LEASE SHALL AUTOMATICALLY RENEW ITSELF for additional periods of the Renewal Period each until either party gives the other notice of nonrenewal at least the Renewal Notice Period prior to the expiration of the then current Term. Owner may change any of the terms of this Lease effective as of any renewal date by giving Tenant notice of the new term(s) at least 15 days more than the Renewal Notice Period before a renewal date. If Tenant fails to terminate this Lease to be effective on that renewal date, as provided above, Tenant shall have accepted all new or changed terms.

5. **RENT:** Tenant shall pay the initial Rent with this Lease for the initial partial month; thereafter, Rent shall be payable by check or money order monthly in advance on the first day of each month WITHOUT DEDUCTION, OFFSET OR DEMAND at Agent's address above. If any Rent is not received by Agent by the Late Date, Tenant shall pay the Late Fee. Furthermore, if any amount is not paid when due, it shall thereafter bear interest at the Default Interest Rate. Tenant further agrees to pay the Returned Check Charge for each check not honored by the bank. Owner or Agent may require all payments to be made by certified funds. Owner may apply any payments received to any obligations then owed by Tenant, in any order and in Owner's discretion.

6. **HOLDING OVER:** If this Lease is not renewed or is terminated and Tenant fails to vacate the Premises by the final day of the Term, Owner may immediately bring an action for possession of the Property. In addition, Tenant shall pay Owner rent at a rate equal to 150% of the rent payable immediately prior to termination, for each month, or part of a month, that Tenant fails to deliver possession of the Premises to Owner. Tenant shall also be liable for any other damages Owner and Agent may incur as a result of Tenant's failure to vacate the Premises. Time is of the essence for all of Tenant's obligations under this Lease.

7. **SECURITY DEPOSIT:** Tenant has deposited the Security Deposit for the faithful performance of all terms and conditions of this Lease including, but not limited to, the return of all keys and surrender of the Premises in good and clean condition, reasonable wear and tear excepted, at the completion of the Term. Tenant may not use any of the security deposit as the last month's rent. Owner may transfer the security deposit to any subsequent owner if the Premises are sold during the Term. The security deposit, less any damages or other offsets, shall be mailed to Tenant, together with an itemized list of deductions, within thirty (30) days after termination or expiration of the tenancy and surrender of the Premises. Agent may retain any interest on the security deposit not required by law to be paid to Tenant. If any portion of the security deposit is used before the end of the Term, Tenant shall immediately, upon notice from Owner, restore the amount so used.

8. **DELIVERY CONDITION:** Should Owner be unable to deliver the Premises to Tenant as agreed through no fault of Owner, then neither Owner nor Agent shall be liable for any resulting damages nor shall this Lease terminate; however, Tenant shall not be liable for any rent until the Premises are available for Tenant to take possession. Tenant may terminate this Lease if Owner fails to deliver the Premises within 30 days of the Starting Date. Tenant acknowledges that the Premises are in a fit and habitable condition, including all required smoke detectors, except for such items that shall be reported by Tenant to Agent in writing within five (5) days of occupancy. Damages not so noted may be charged to Tenant at termination.

9. **UTILITIES:** Tenant shall pay for all utilities (including stormwater management fees) and services except the Included Utilities, which shall be paid by Owner.

10. **PETS:** Tenant shall not permit any animals, wild or domestic, on the Premises without the prior written consent of Owner. Owner may withhold or condition that consent at Owner's discretion. If Tenant violates this provision of this Lease, Tenant shall pay Owner the Default Pet Rent for each month the violation continues, as additional rent. In addition, Owner may require Tenant to remove the animal. Regardless of Owner's consent, Tenant shall be liable for any damages caused by the animal, including carpet cleaning/replacement and pest treatment, even if not discovered until up to 30 days after the end of the Term. If Tenant permits an animal on the Premises, Tenant must have all carpets professionally cleaned and the Premises professionally exterminated at the end of the Term, with receipts provided to Agent.

11. **EARLY TERMINATION BY MILITARY PERSONNEL:** If Tenant is a member of the armed forces of the United States or a member of the Virginia National Guard serving on full-time active duty or as a Civil Service technician with a National Guard unit who (1) has received permanent change of station orders to a duty station which is not within a thirty-five (35) mile radius from the Premises; (2) has received temporary orders for over three months to such a station; (3) is discharged or released from such duty or technician status, or (4) is ordered to report to government-supplied quarters resulting in a forfeiture of basic allowance for quarters, Tenant may terminate this Lease by giving Owner written notice stating the date this Lease will terminate together with a cashier's or certified check for liquidated damages under this section. The date of termination must be at least thirty (30) days after Owner receives the notice and not more than sixty (60) days before the change in status. Prior to termination, Tenant must provide Owner a copy of the official orders of change in status or a letter confirming the orders signed by the Tenant's commanding officer. If Tenant terminates this Lease pursuant to this section, Tenant shall pay Landlord liquidated damages for the early termination equal to (1) one month's Rent if the termination date is less than six months after the initial Starting Date or (2) one-half of one month's Rent if the termination date is more than six months, but less than twelve months, after the initial Starting Date.

12. **ASSIGNMENT AND SUBLETTING:** Tenant shall not assign this Lease or sublet any or all of the Premises without written consent of Owner. Owner may assess an Assignment Fee for administrative purposes in connection with any request for consent to any sublease or assignment. Any request for consent to any sublease or assignment must be on forms provided by Agent. Owner's consent to any sublease or assignment shall not waive Owner's right to approve or disapprove of any future sublease or assignment. Owner may assign this Lease at any time without the consent of Tenant.

13. **ALTERATION/REPAIR:** Tenant shall not perform any renovation/alteration without prior written consent of Owner including, but not limited to, carpeting, painting, wallpapering or staining. Tenant shall not change existing or install new (A) heat/air conditioning equipment, (B) antennae/cable connections, (C) telephone outlets, (D) appliances, (E) lighting fixtures, or (F) locks without prior written consent of Owner. Any improvements will become a permanent part of the Premises and may not be removed at termination or expiration of Lease; however, Owner reserves the right to require Tenant to return the Premises to its original condition. Tenant shall give Owner prompt notice of all accidents to or malfunctions of any part of the Premises. Repairs shall be made at Owner's discretion and with due diligence, and Tenant shall pay for all repairs caused by the acts or omissions of Tenant, his family, guests or agents. Tenant shall promptly report and pay the cost of repair or replacement of all broken or damaged glass, screens, doors, and wood, regardless of the cause of the damage, including acts of strangers. Tenant shall not place on the Premises water beds, portable heaters, or woodburning stoves without written permission of Owner. Tenant shall keep the Premises in clean and sanitary condition and free of vermin and other pests. Tenant shall have the carpet professionally cleaned by a cleaning company approved by Owner (a) at least once a year and (b) at the end of the Term. Tenant shall have the fireplace and chimney

SAMPLE

MEMORANDUM OF AGREEMENT

FIRST DRAFT

MEMORANDUM OF AGREEMENT

ESTABLISHING THE AIRPORT LAND USE ADVISORY COMMITTEE

FOR THE

PIONEER VALLEY

This memorandum is agreed to by and among the municipalities of _____, and the Pioneer Valley Planning Commission for the purpose of establishing an Airport Land Use Advisory Committee (ALUAC).

Whereas, the municipalities and PVPC support the concept of cooperative planning and review of land use and development for the purpose of ensuring the coordination of efforts to achieve the most optimum possible compatibility between the land use needs of the communities and the airport; and

Whereas, the municipalities and PVPC increasingly recognize that the Westover Air Reserve Base and Westover Metropolitan Development Corporation have a significant impact on the land use and economy of the region; and

Whereas the municipalities and PVPC recognize that early and consistent consultation with all possible interested parties is the most valuable tool for ensuring that community concerns are addressed in the airport planning process;

Therefore, be it resolved, that the municipalities and PVPC do hereby form a permanent Committee, to be known as the Airport Land Use Advisory Committee.

The primary functions of ALUAC shall be as follows:

1. To assist and advise all local and regional agencies, boards and authorities in their policies and planning as the relate to land use impacted by Westover Air Reserve Base.

2. To maintain contact with the Air Force Reserve at Westover and the Westover Metropolitan Development Corporation in order to assure the flow of accurate information to and from the communities.

3. To pursue governmental and public awareness of the land use issues related to Westover Air Reserve Base.

4. To assist communities in the identification of land use issues related to Westover Air Reserve Base

5. To identify, acquire and maintain the data needed to analyze base-related impacts.

6. To develop methods for analyzing such impacts.

DISCLOSURE AGREEMENT - LUDLOW

NOTICE

This Agreement is between FREDERICK T. SZLOSEK (hereinafter "Grantor") and the TOWN OF LUDLOW through its Planning Board.

Grantor herein gives notice that the real estate located at
ELAINE DRIVE, LUDLOW, MASSACHSUETTS
SZLOSEK ROAD, LUDLOW, MASSACHSUETTS
LAWTON STREET, LUDLOW MASSACHSUETTS
and recorded in the Hampden County Registry of Deeds in Book 6311, Page 48 (Book of Plans 256, Page 66) and in Book 4722, Page 97 (Book of Plans 262, page 84) is subject to certain overflight rights of the United States Air Force.

A more definitive description of said rights as they may effect the aforesaid premises is available at the Office of the Planning Board of the Town of Ludlow, 488 Chapin Street, Ludlow, Massachsuetts and as specifically described in a AICUZ Study dated August 8, 1990.

Grantor agrees that reference to this notice shall run with the land and shall obligate the Grantor and his heirs and successors and assigns to make reference to this notice in each and every conveyance of this parcel or any part thereof.

Dated: May 9, 1991

Frederick T. Szlosek

RECEIVED
MAY-9 1991
AT 1:55 pm AND
REG'D FROM THE ORIGINAL

Joao M.V. Dias, Planning Board

John D. Silva, Planning Board

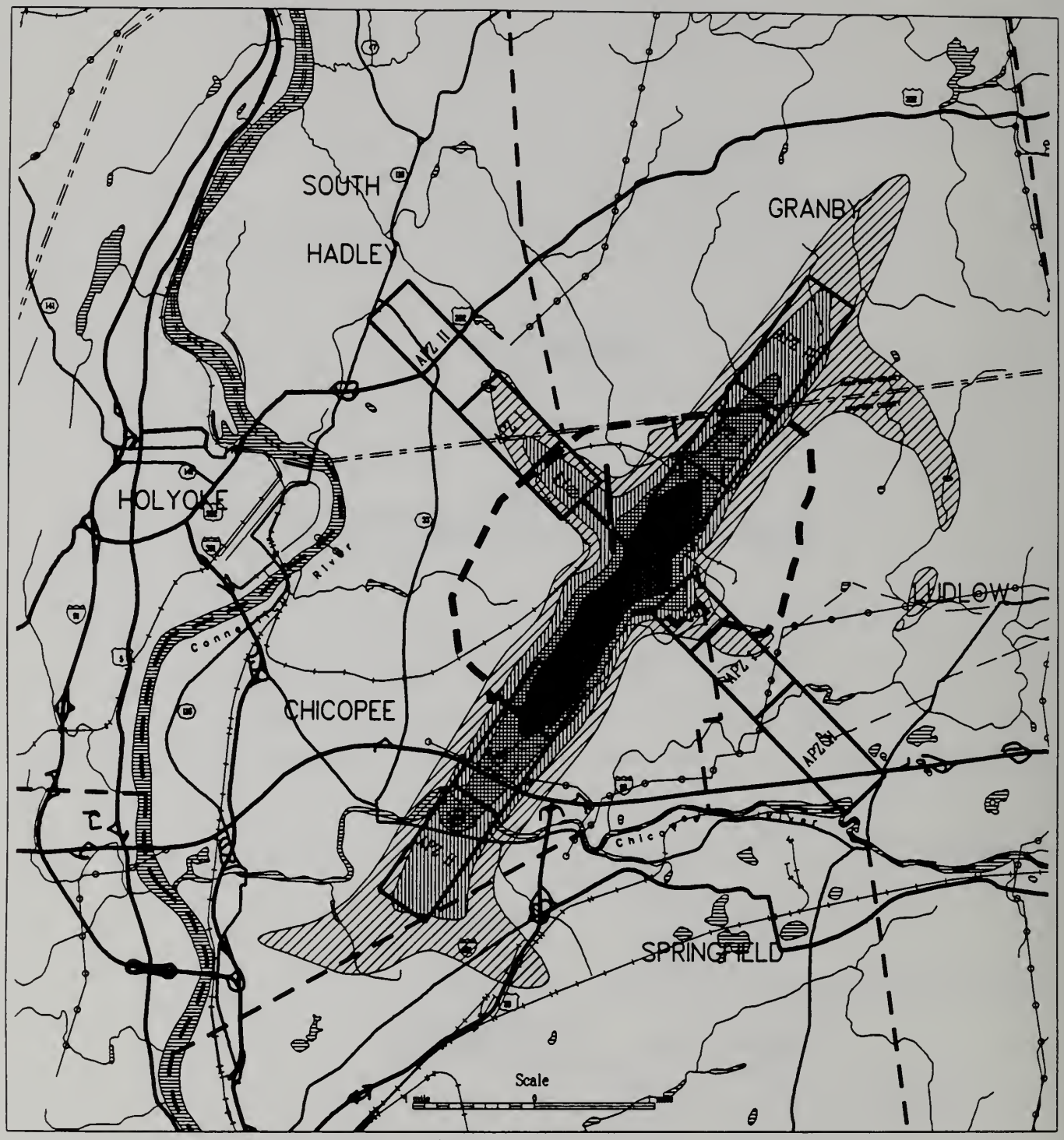
Victor Jay Field, Planning Board

David B. Irvine, Planning Board

Robert C. Chevalier, Planning Board

APPENDIX D

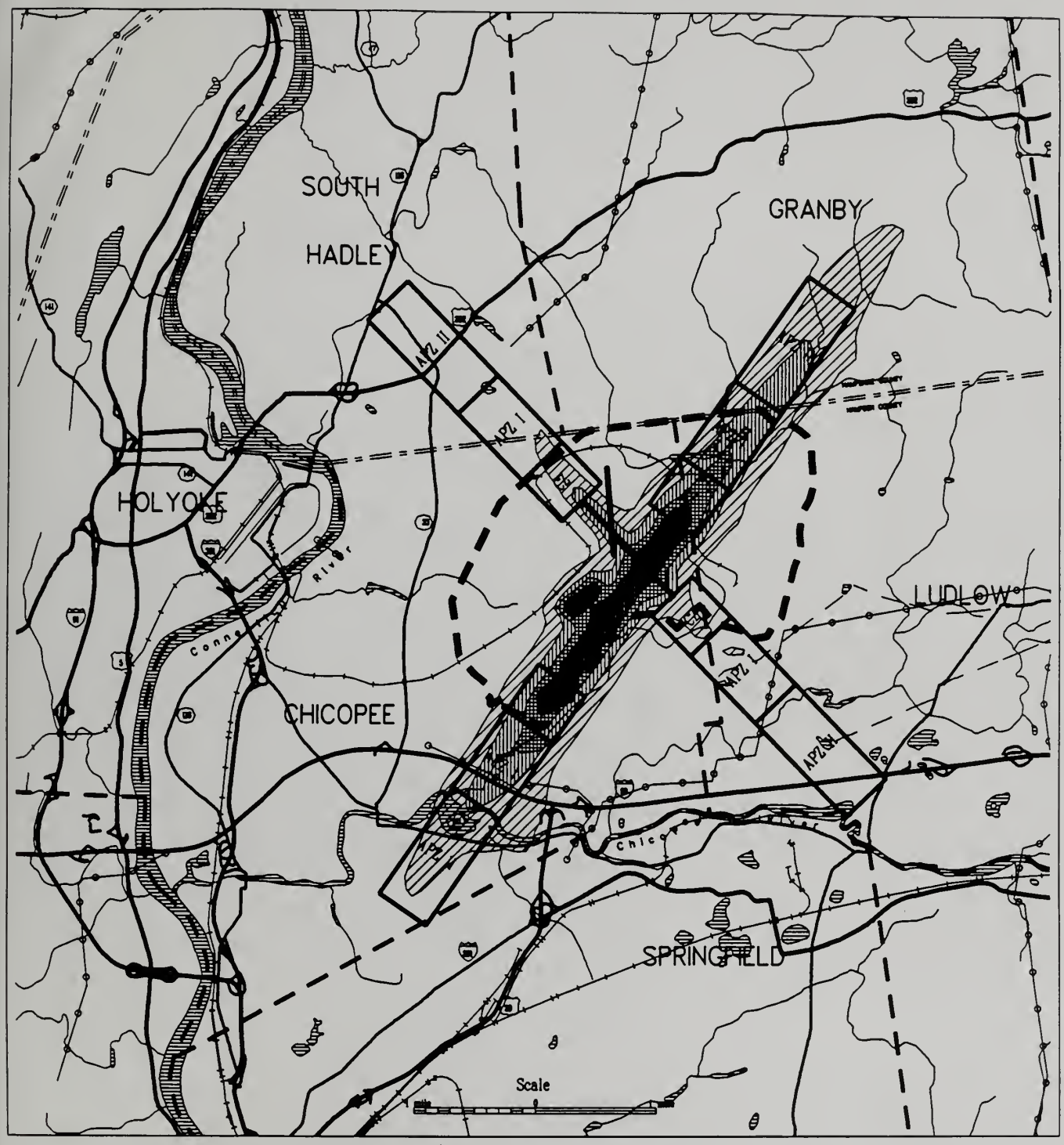
1990 & 1993
AVERAGE DAY/NIGHT NOISE LEVELS



Average Day/Night Noise Levels

65 - 70 Ldn
70 - 75 Ldn
75 - 80 Ldn
80 Plus Ldn

Noise Contours for 1990 at Westover ARB



Average Day/Night Noise Levels

65 - 70 Ldn
70 - 75 Ldn
75 - 80 Ldn
80 Plus Ldn

Noise Contours for 1993 at Westover ARB

Pioneer Valley Planning Commission